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MILITARY PANORAMIC SKETCHING

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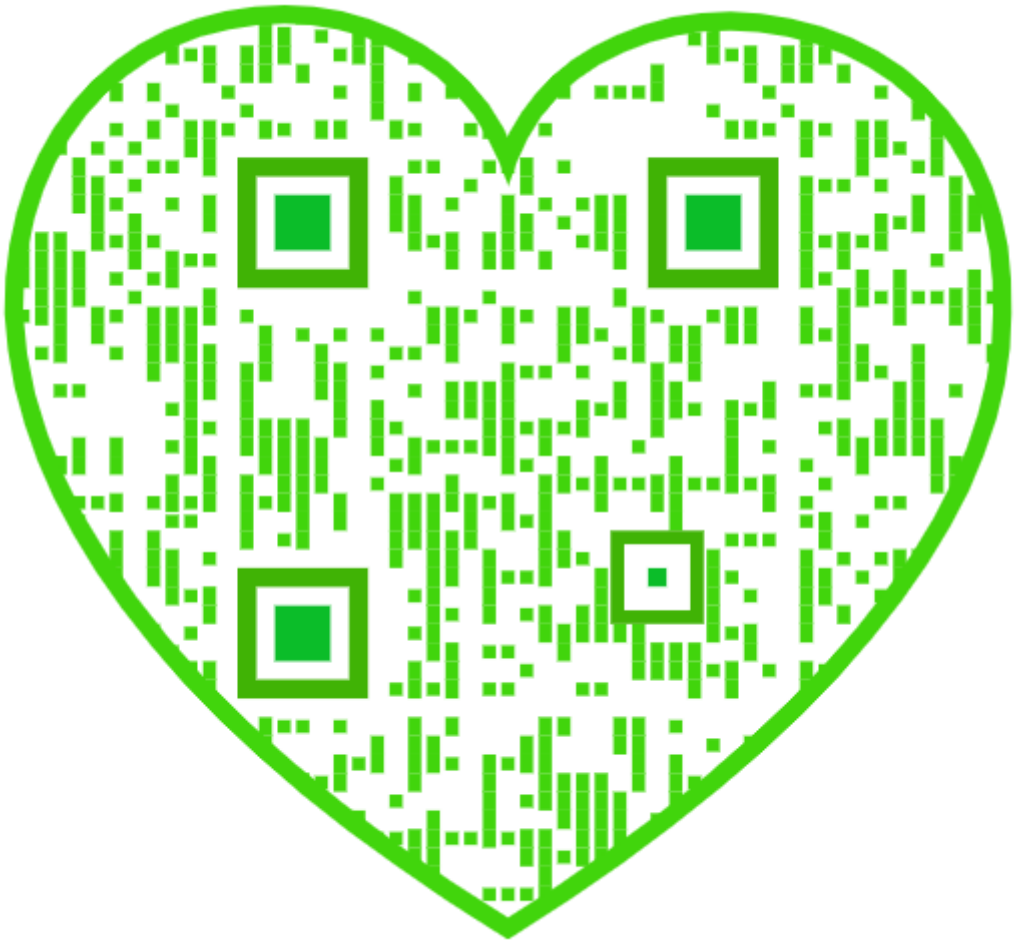

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MILITARY PANORAMIC SKETCHING.

BY

CAPTAIN J. J. FULMER,
U. S. Armv.

1917.

FRANKLIN HUDSON PUBLISHING CO.,
Kansas City, Mo.

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By
CAPTAIN J. J. FULMER,
Fort Leavenworth, Kans.

INTRODUCTION.

Ability on the part of an officer to make rapid and clear landscape sketches is positively essential to complete equipment for duty in the field. For many years we have appreciated the great value of such sketches in reports by English military observers and attachés, and have regretted that more attention was not paid to this art in our own service. The importance of the role of landscape sketching has been greatly enhanced by the application of more scientific methods to the control and direction of artillery and small-arms fire.

In MILITARY PANORAMIC SKETCHING Captain Fulmer has presented the subject in such a manner that any officer, whether or not possessed of artistic ability, can, by conscientiously following the methods laid down, in a short time attain a degree of proficiency which will greatly increase his usefulness in his profession.

I predict for this little book a cordial reception by the Service, and feel that we should be grateful to the author for such a valuable and timely addition to our military literature.

M. L. WALKER,

Lieutenant-Colonel, Engineers,
U. S. Army.

382150

PREFACE.

The following notes and sketches are intended to present in a simple manner some of the basic principles of military sketching.

The illustrations are arranged to show the successive steps to be followed in making landscape sketches in such a way as to clearly portray and convey information of military value. Such sketching enables the graphical representation of important features of the terrain, rendering a map more comprehensive or the location of targets, as the enemy's trenches, machine guns, snipers, artillery, or the assignment of objectives and sectors.

No artistic ability is necessary to acquire a fair degree of proficiency in this work, as indicated from the fact that a number of men made very fair sketches of actual terrain after about three hours' application of the principles herein outlined.

I am indebted to Captain John A. Crane, Field Artillery, for the preparation of data relating to the sketch for artillery, and to Sergeant Oscar Leach, 4th Dis. Co., for help in the preparation of drawings.

FORT LEAVENWORTH, KANSAS, J. J. FULMER.

June, 1917.

MILITARY PANORAMIC SKETCHING.

Panoramic sketching is one of the best means of giving certain military information. Its great value lies in the fact that a few lines will tell more, with less chance for error and in much less time, than by any other means. A written report, no matter how carefully worded, stands a chance of being misunderstood, aside from the fact that considerable time is consumed in the making. The limitations of a written report are naturally in direct proportion to the ability of the writer.

Photography may be at times a substitute for panoramic sketching, but is dependent upon light, atmospheric conditions, and such occasions when a delay is of no consequence. Unfortunately, the very essence of transmission of military information, aside from accuracy, is dispatch. Photographs also show the immediate foreground emphasized, while the distant and very necessary details are scarcely discernible.

The panoramic sketch shows terrain graphically and so simply that it requires no training to comprehend its meaning. A scout spends a few minutes in making the following sketch:

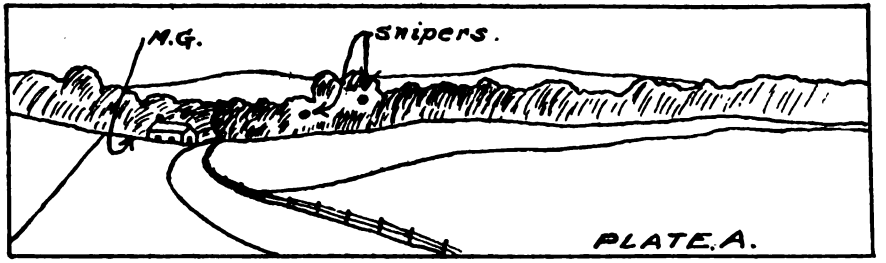


PLATE A.

Its meaning is clear, its rendition required no artistic ability, it takes no trained mind to interpret it, and the scout proceeds on his mission with but little delay.

Panoramic sketching presents the terrain in elevation, while topographical sketching presents projection on a horizontal plane and gives a view of outline, without perspective, as if the observer viewed each point from a position vertically overhead.

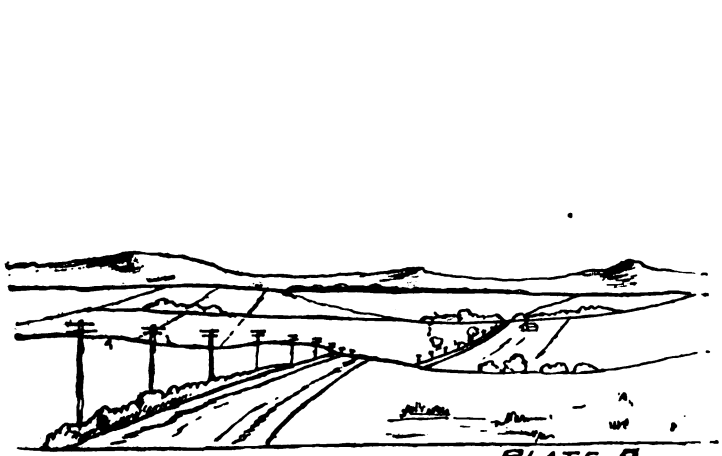


PLATE B.

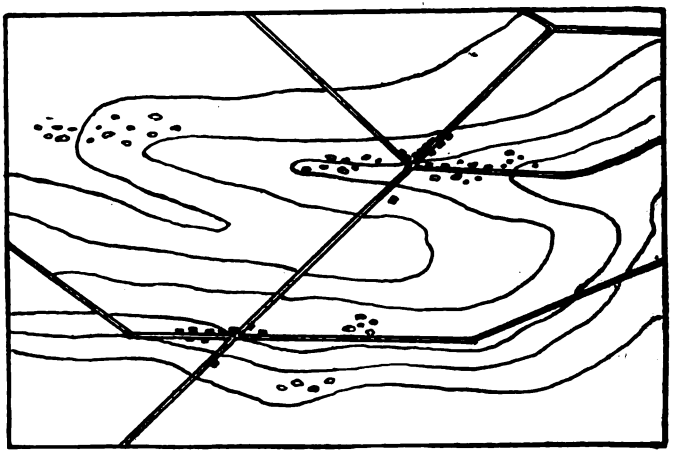


PLATE C.

PLATES B AND C.

Plates B and C show a comparison of panoramic and topographical sketches of the same terrain. Plate C shows terrain too near the base of hills,

As a means for training the eye, to judge ground rapidly, to determine the essential military features, and to develop ability to retain correct mental impressions of the terrain, there is no surer way than by panoramic sketching.

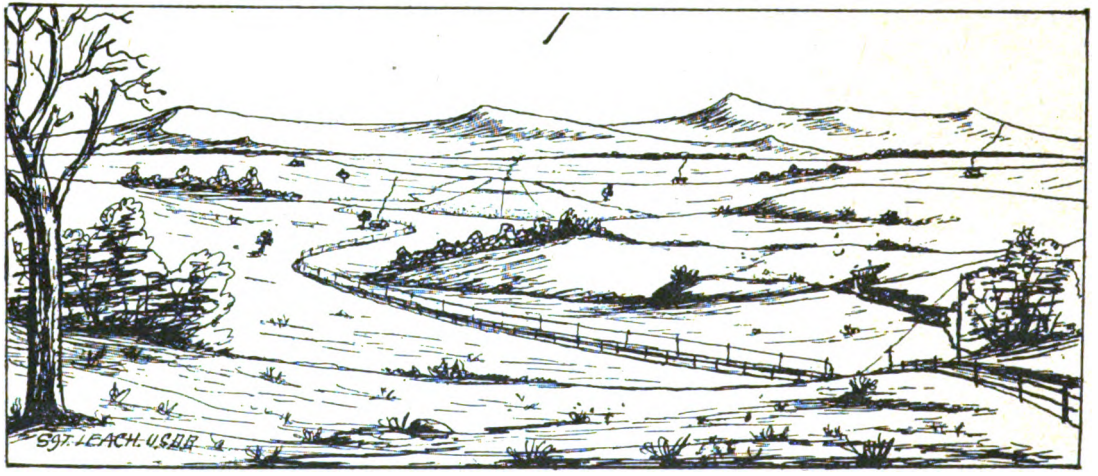


PLATE 1.

The mechanical part of military sketching consists of:

1. *Delineation.*—Portrayal of how objects or features of the landscape appear to the observer, modified by varying light, shadow, and distance.

2. *Perspective.*—"The effect of distance upon the appearance of objects; delineating objects so that they seem to lessen as they recede from the eye."

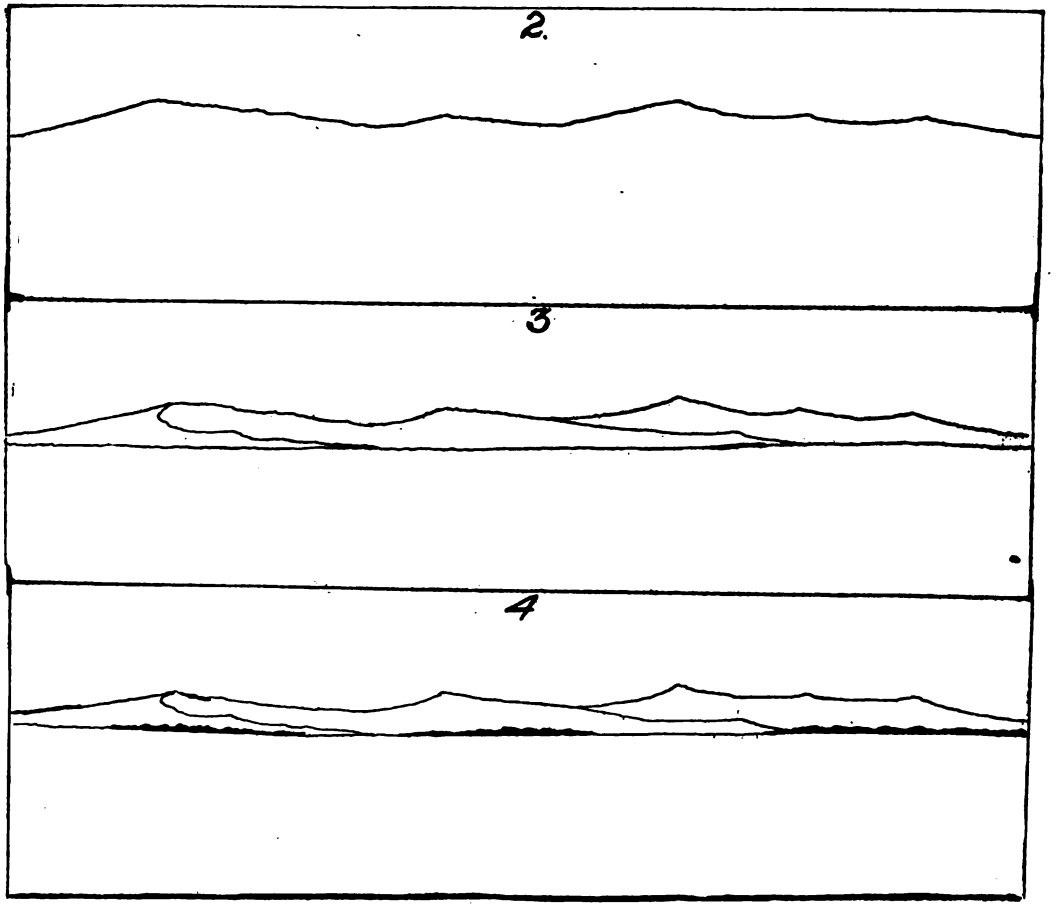
3. *Sketching.*—Observing the principles of delineation and perspective in the simple portrayal of such parts or features of the terrain which are necessary to frame in or draw attention to certain positions from which information of military value is obtained.

1. *Delineation.*—A landscape is made up of light, shadow, and color contrasts. Analyzing Plate 1, there results the following:

2. *Skyline.* The contrast between the coloring of the sky and the distant hilltops.

3. The junction of the form or crest lines and the slope of the hills with the level ground.

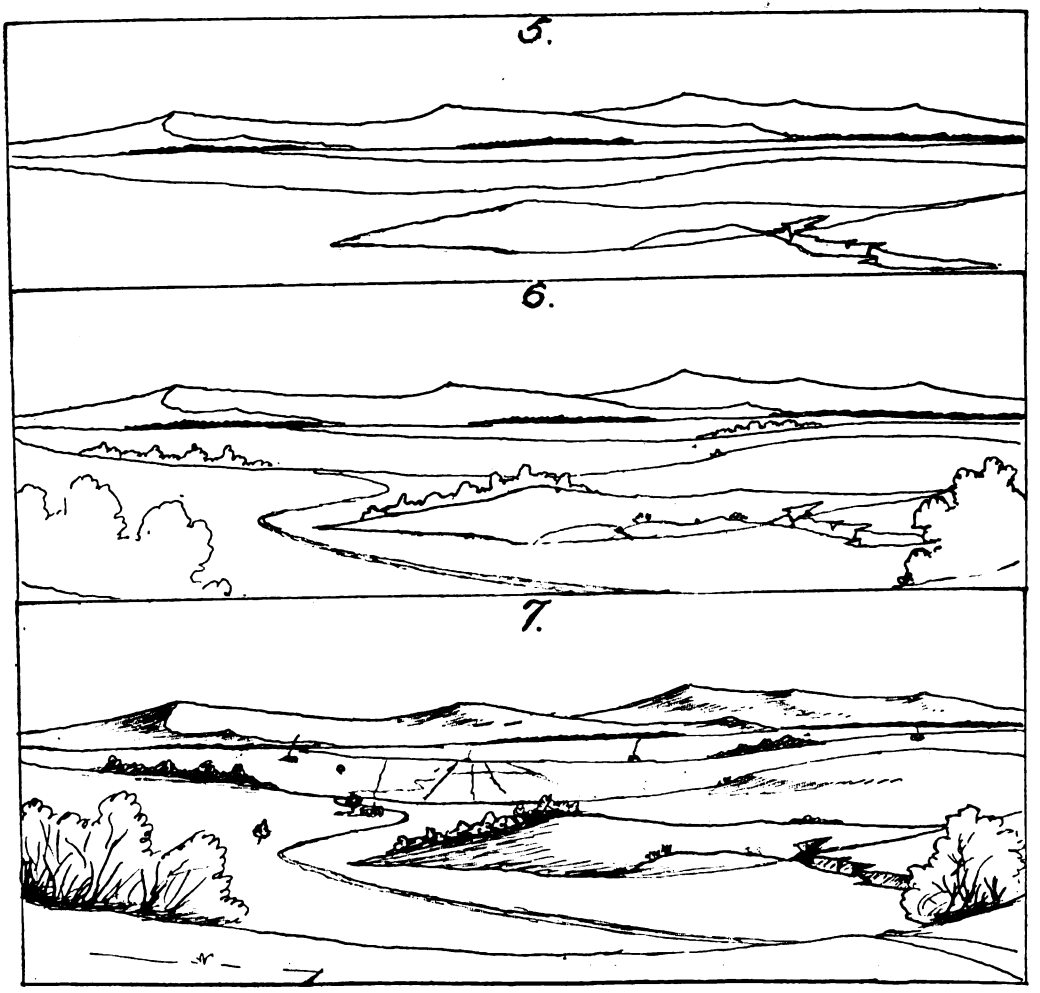
4. Trees at the base of the hills, which are apparent by reason of contrast due to a darker shadow or coloring than the surrounding objects.



5. Crest lines, indicating slopes, apparent by reason of shadow.

6. Outline of underbrush and trees.

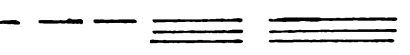
7. Addition of shading.



Exercise

Draw, free hand, several vertical lines with one stroke of the pencil. then longer ones and still longer ones

Then draw horizontal lines in similar manner.



Draw different kinds of houses

Draw different kinds of trees and fences.

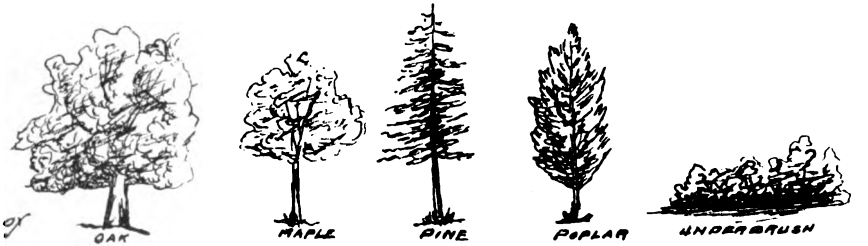


PLATE 8.

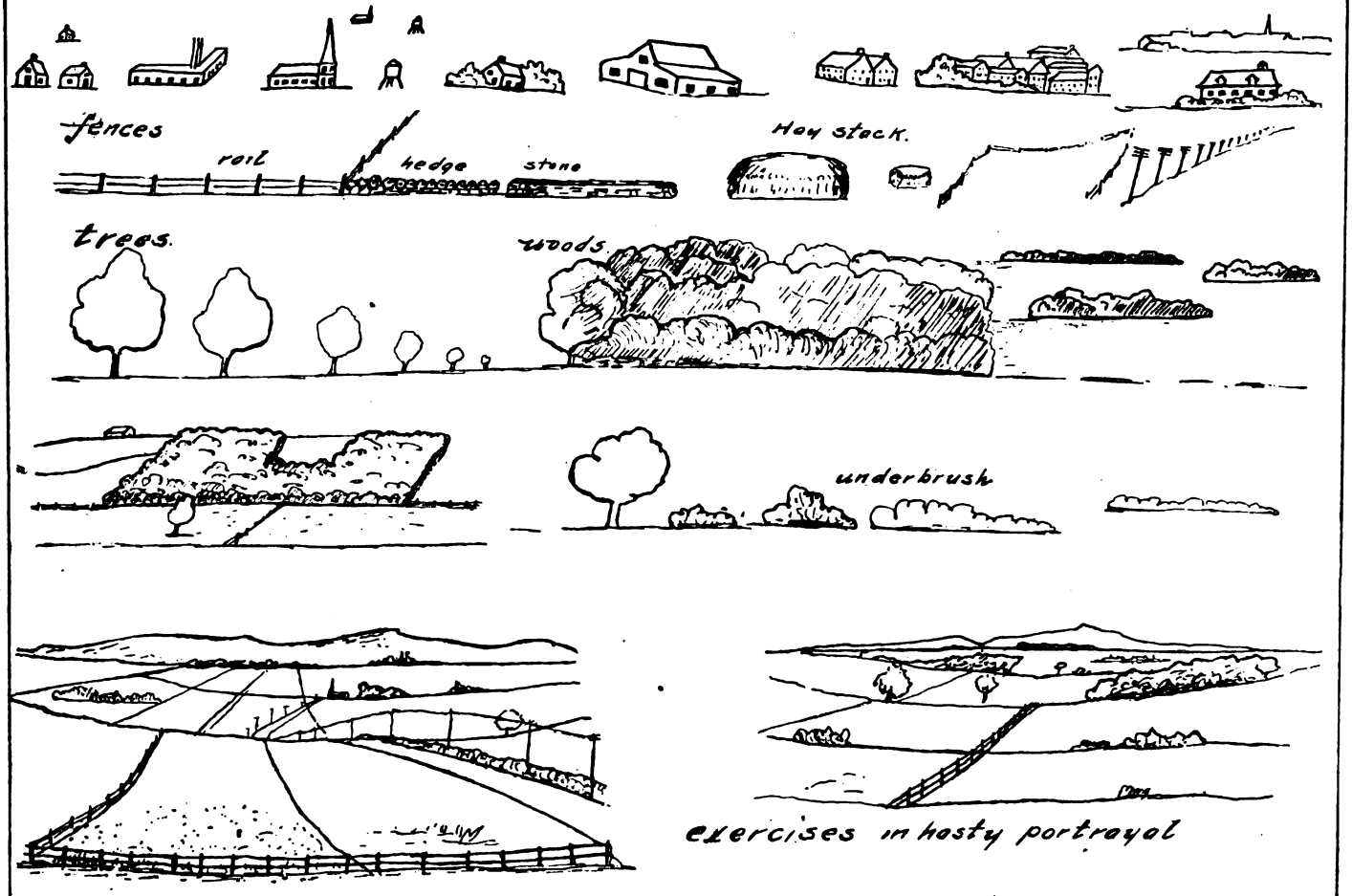

fences
rail
hedge
stone
Hay stack.
trees.
woods
underbrush
exercises in hasty portrayal

PLATE 9

Considerable benefit will be derived by making a copy of Plates 1 to 9 until ability is developed in portrayal of the simpler phases of panoramic sketching, which teaches how to delineate and the successive steps to be followed. Many of the following plates are included for the purpose of affording an example or guide, which, when copied, will be found to be a help in hasty sketching.

The following plates are intended to illustrate the simple methods of making landscape sketches. Sufficient detail must be shown to *attract attention* to particular points, from which, by arrangement of successive objects, the desired positions are located.

10

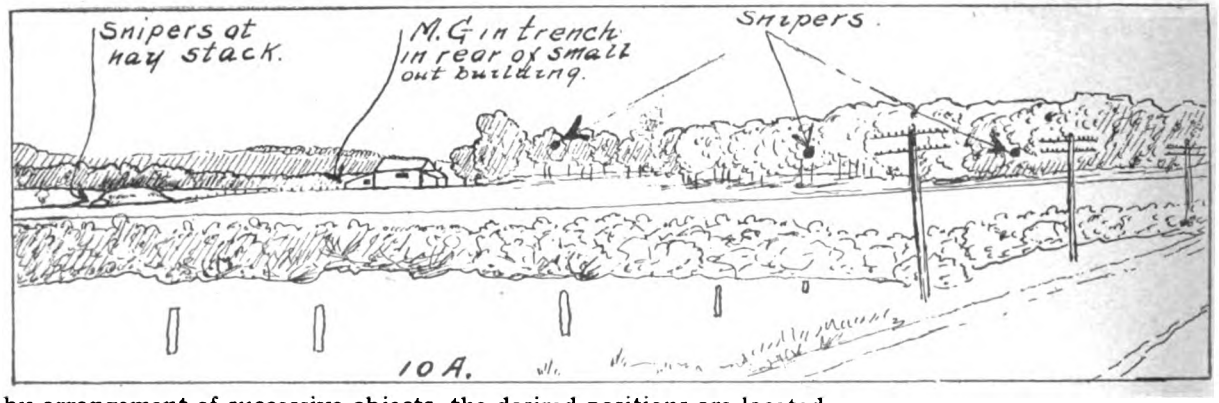


Plate 10 shows a photograph of a portion of terrain in front of a detached post.

Plate 10–A shows a hasty sketch of the same terrain for the purpose of conveying certain information.

Note in this sketch the appearance of objects—not as they are, but as they appear to the observer. The underbrush and trees are not covered with leaves and grass does not seem to occupy a prominent place in the sketch, yet a fair representation of the terrain is shown.

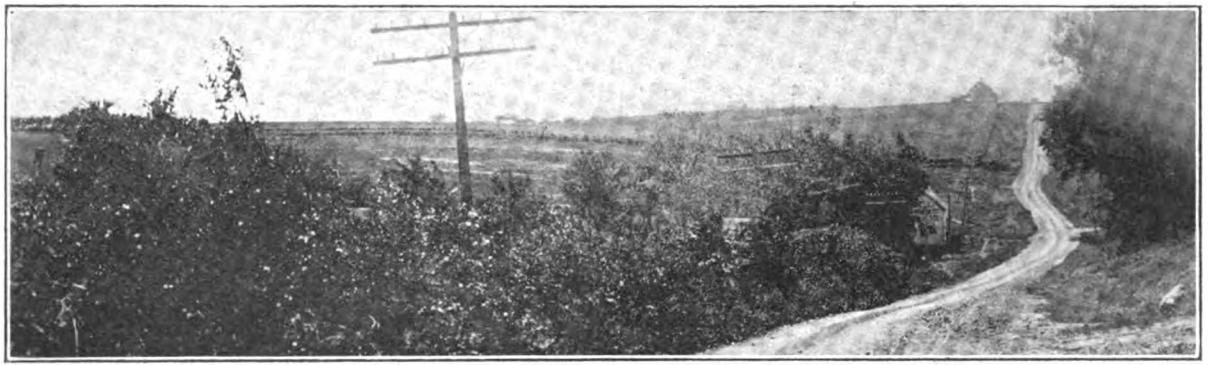


PLATE 11.

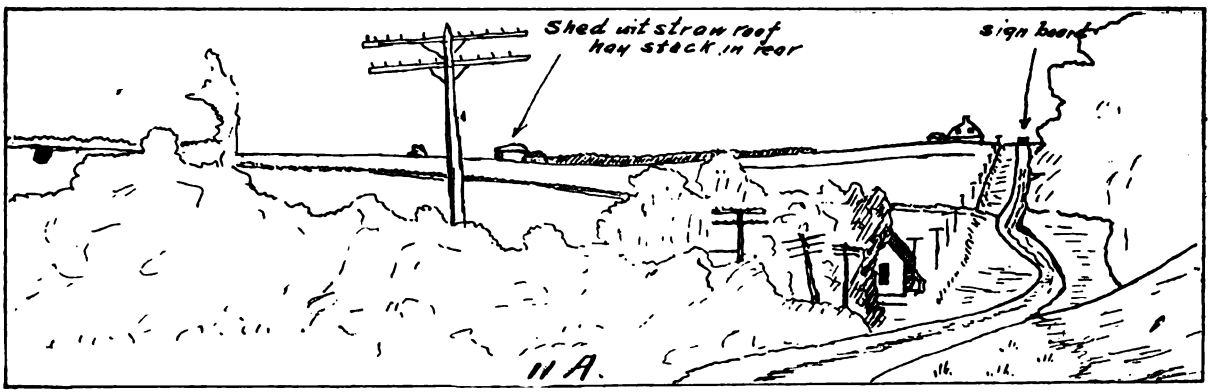


Plate 11 shows a road ending at the top of a hill, to the left of which is a barn with a small side building in silhouette. To the left along ridge is a small shed, covered with hay, in rear of which is a haystack. Any positions near these points can be easily located, because attention has been attracted to prominent features. Emphasis, in the way of enlargement, should be added to the objects desired, which makes a sketch far more valuable than a photograph for the purpose intended.

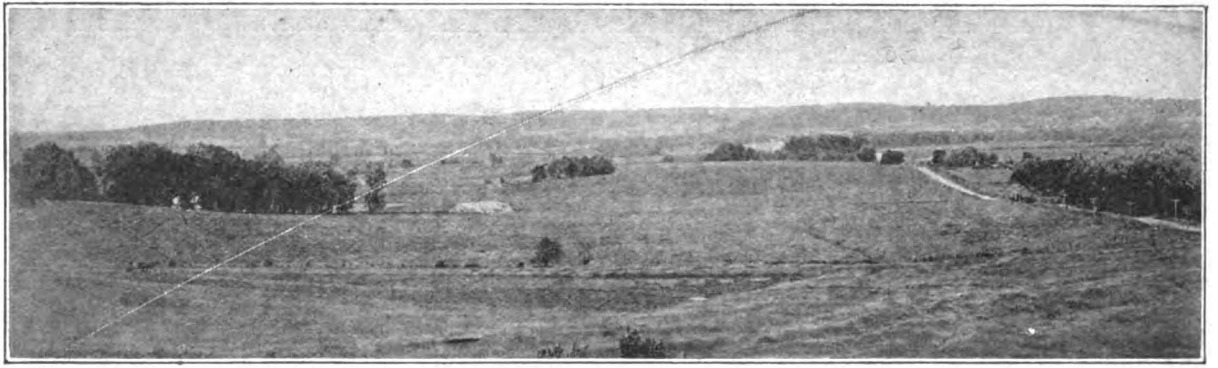


PLATE 12.

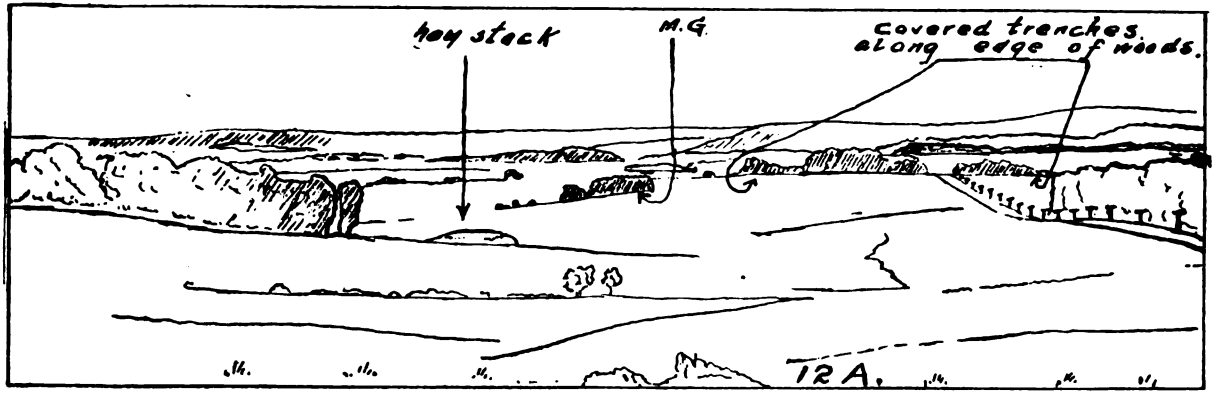


PLATE 12-A.

Plate 12 shows prominently woods, a haystack, and a road. The machine guns and trenches are quickly located from these features.

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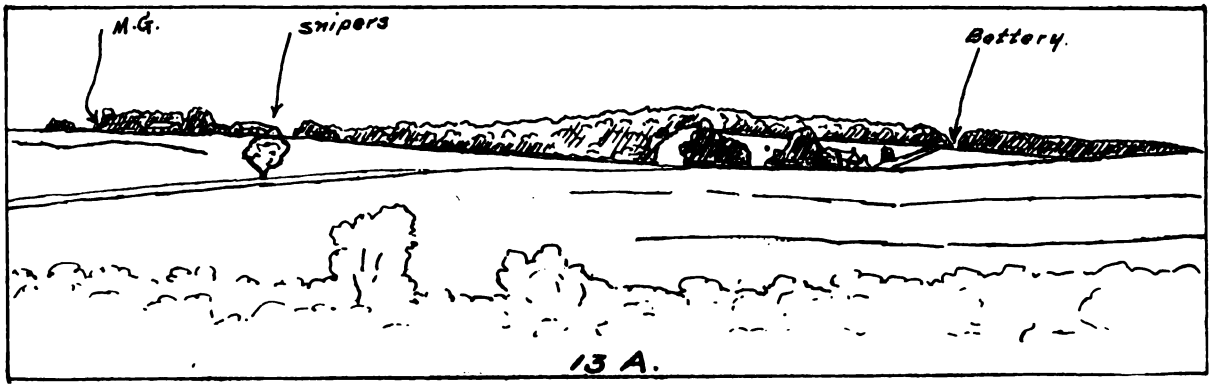
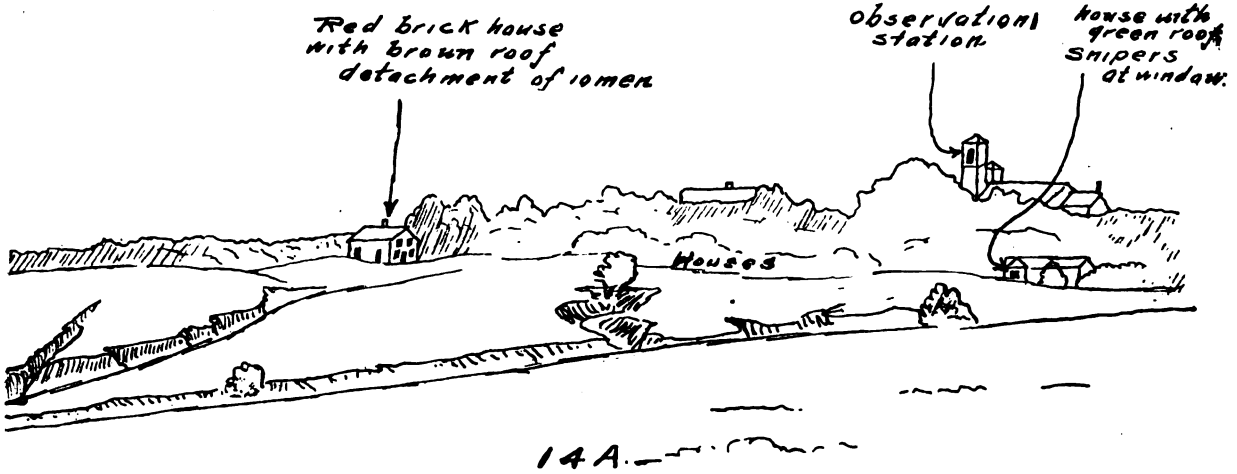


PLATES 13 AND 13-A.

A simple sketch of terrain in front of an outpost position.

14



PLATES 14 AND 14-A.

In Plate 14 attention is first attracted by the church tower. The building near it with the green roof contains snipers, and the red brick house to the left with the brown roof contains a detachment of men. Sufficient information is conveyed by showing the foliage line, the church, and the houses having the distinguishing marks

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2. PERSPECTIVE.

A ground glass, the kind ordinarily used in cameras with a hood covering, will reduce panoramic sketching to simplicity itself. Such means are not available, however, in the field, and military sketching must bridge over the lack of usual appliances by the use of simple expedients.

If a transparent plane is interposed between an observer and an object, and a drawing made on the transparency of the object as it appears, there results a perspective drawing. Let a window be assumed as the transparency, on which is drawn a landscape as it appears. Example, Plate 15.

Notice the relative size of trees in space 6 as compared to 7 and 4; yet these trees are of the same height, but on the picture their size is dependent upon the distance from the observer, or the result of perspeetive.

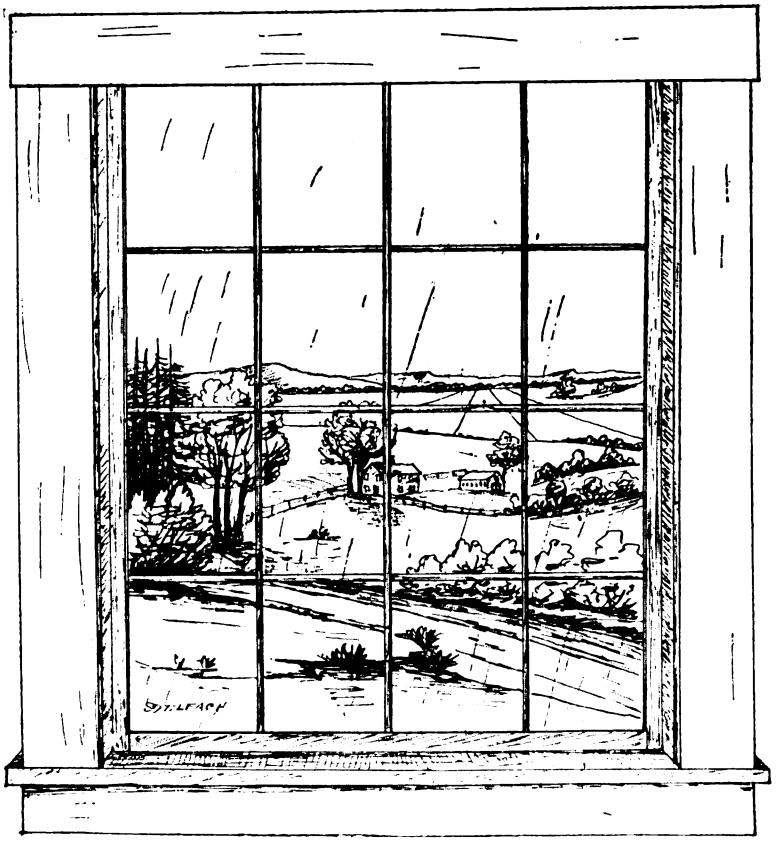


PLATE 15.

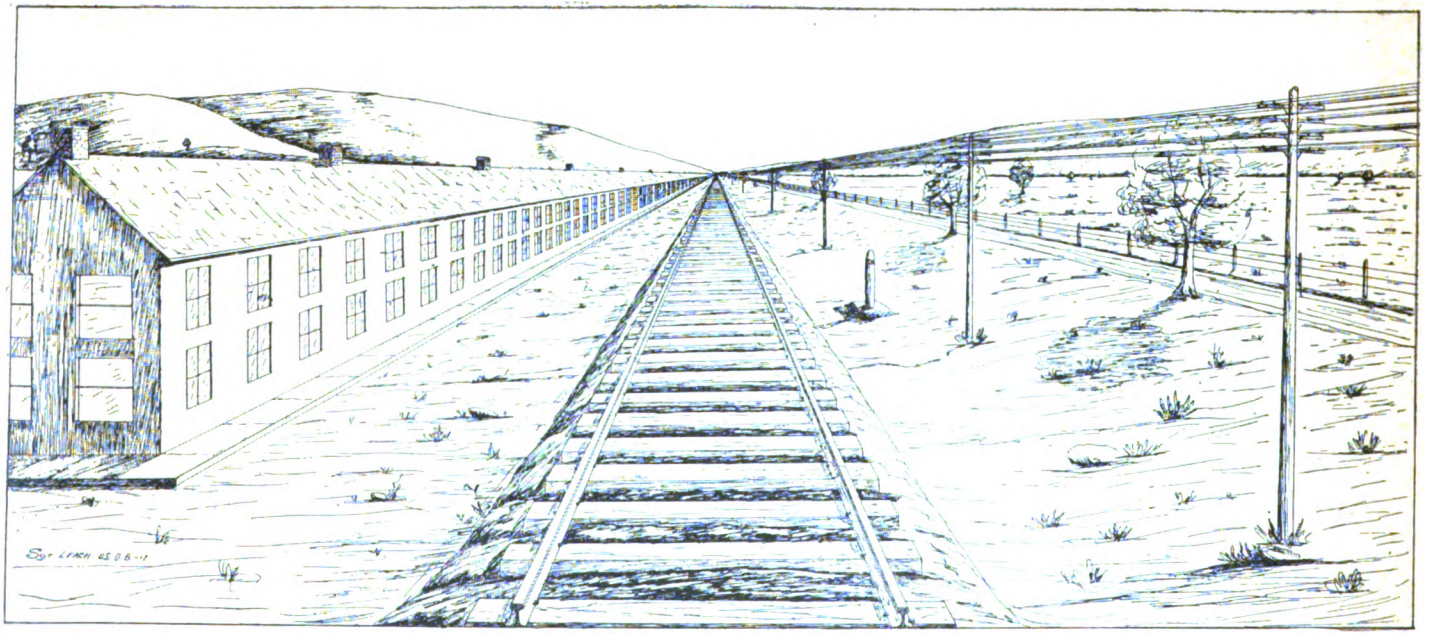


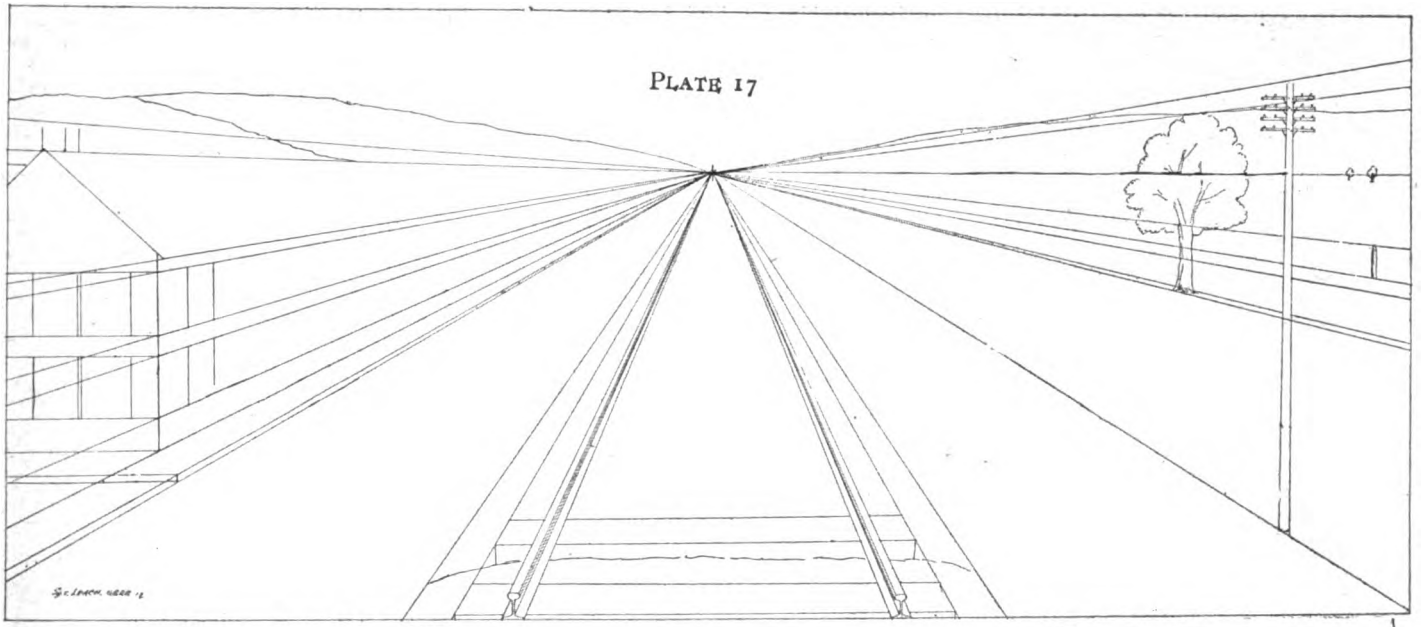
PLATE 16.

The principles of perspective are shown in Plate 16. The building, railroad, telegraph lines, trees, and fences all seem to vanish at a point, due to the effect of distance upon the appearance of objects, better explained in Plate 17, which gives only the skeleton lines that determine the size of objects.

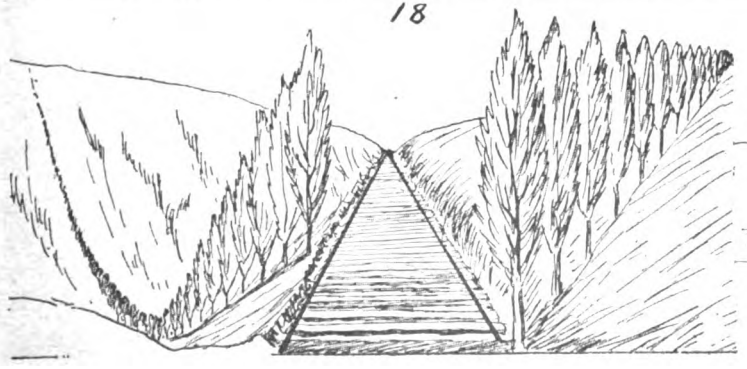
"Vanishing-points are points in a picture to which the perspective of all lines converge that in the original objects are parallel to each other."

Objects in a plane not parallel to these shown would have a different vanishing-point. Assuming the railroad in Plate 16 runs north; suppose aside of it is a line of trees running east of north, one west of north, one up and one down a grade. Five series of parallel lines, all of which have a different vanishing-point, are then presented, as shown in plates 18 and 19.

PLATE 17



18



19.

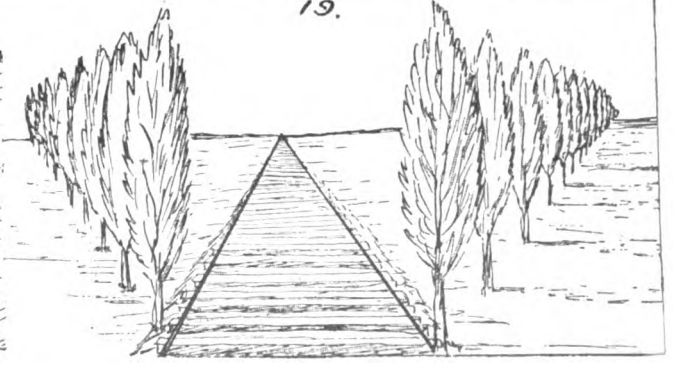


PLATE 20

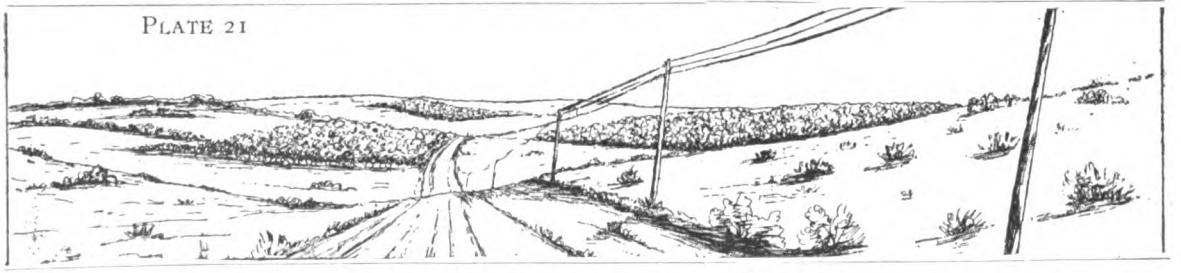
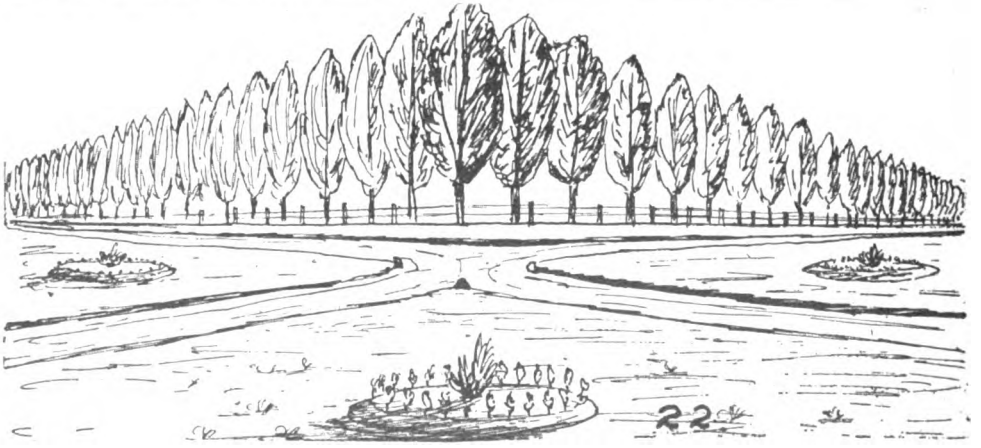


PLATE 21



22

PLATES 20, 21, and 22 illustrate perspective applied to different view.

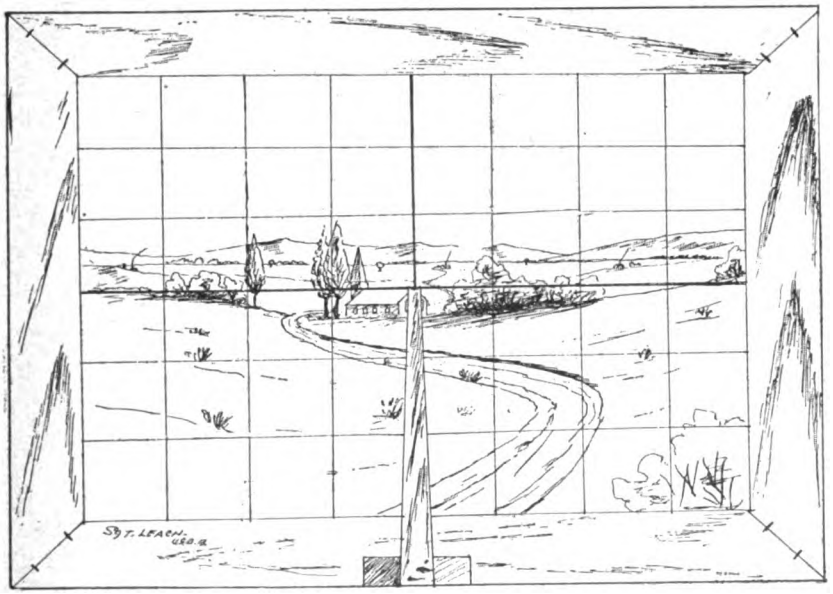


PLATE 23.

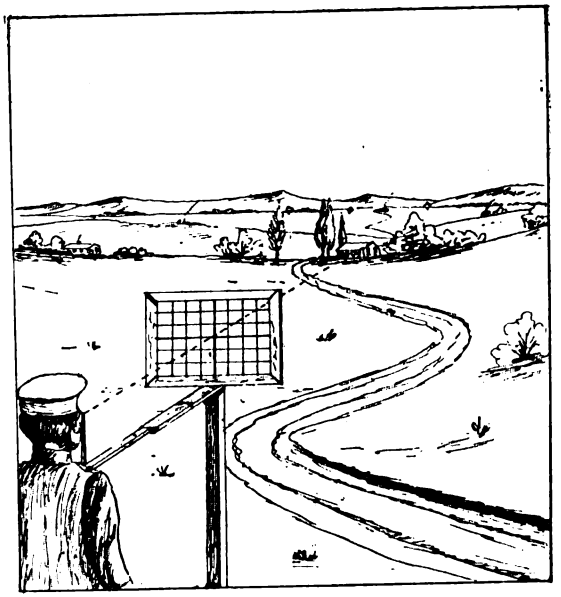
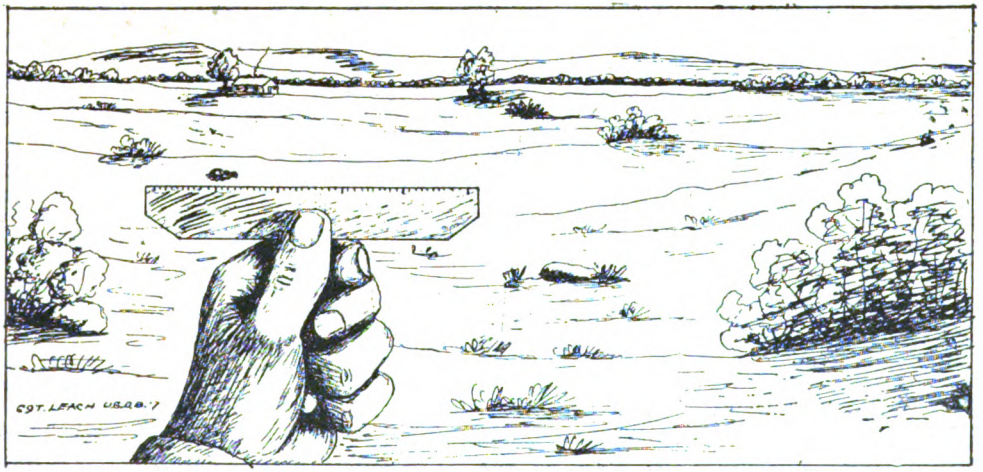


PLATE 24.

The effect of perspective can be obtained with a frame, size about 8x10 inches, having stretched on it thread or wire, as shown in Plate 23, and held a suitable distance from the eye. On a paper, ruled similar to the squares of the frame, is drawn the lanscape as it appears, each object governed in size and location by its appearence in the squares of the frame (Plate 24). It must be noted that the eye is held in the same relative position to the frame throughout the sketch. In this plate the intersection of the two dark lines* is placed on the church roof, and the sketch completed with the frame in this position. This method is intended *only for beginners*.

*These lines are of different colored material for the purpose of centering the view on a particular point of the terrain.



Another method is with the mil scale or notched stick, as in Plate 25, used practically the same as the frame just described.

PLATE 25.

PLATE 26.

Plate 26 shows the final method to be used. The measurement of the height of the house and the length of the underbrush is shown in this plate, which measurement is transferred to the sketch. Similarly, all sizes and locations are determined. The distance the pencil is held from the eye must be the same throughout the sketch.

3. MILITARY SKETCHING.

A military sketch should be simple, with lines clearly defined and unnecessary details and shading eliminated.

EQUIPMENT.

Medium black pencil (colored pencils are of use.)	Compass.
	Mil rule.
Knife.	Note-book or pad for sketching.

For practice, sheets the size of from 5 to 6½ by 8 to 10½ inches, having horizontal lines and vertical lines 1-inch apart, lightly drawn, will be of value. Such lines are of help when beginning the sketch, as shown in Plate 27.

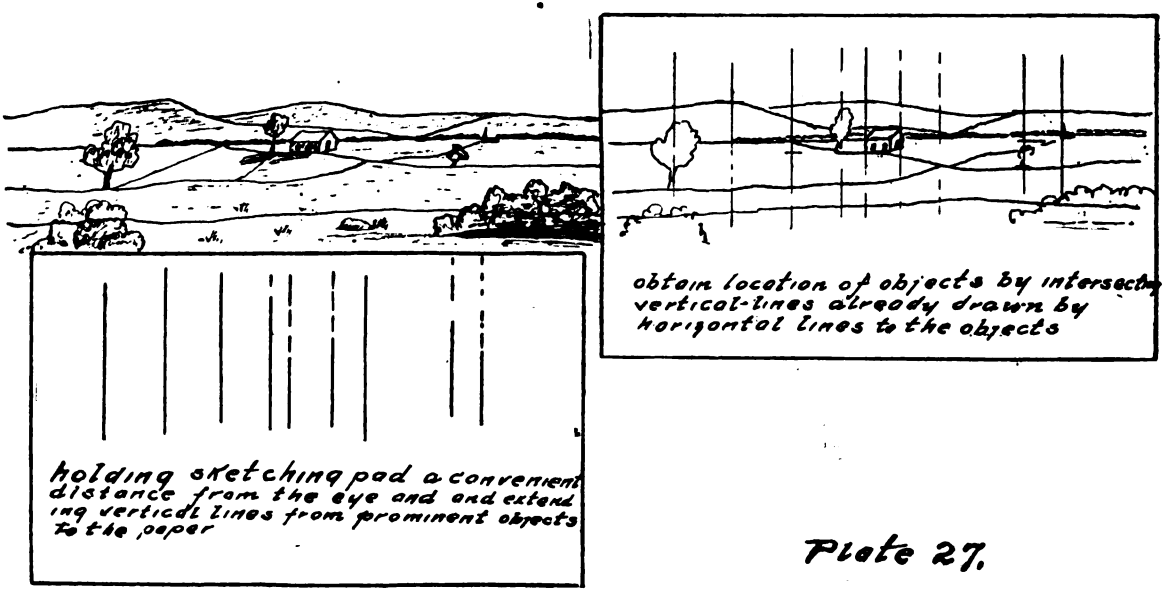
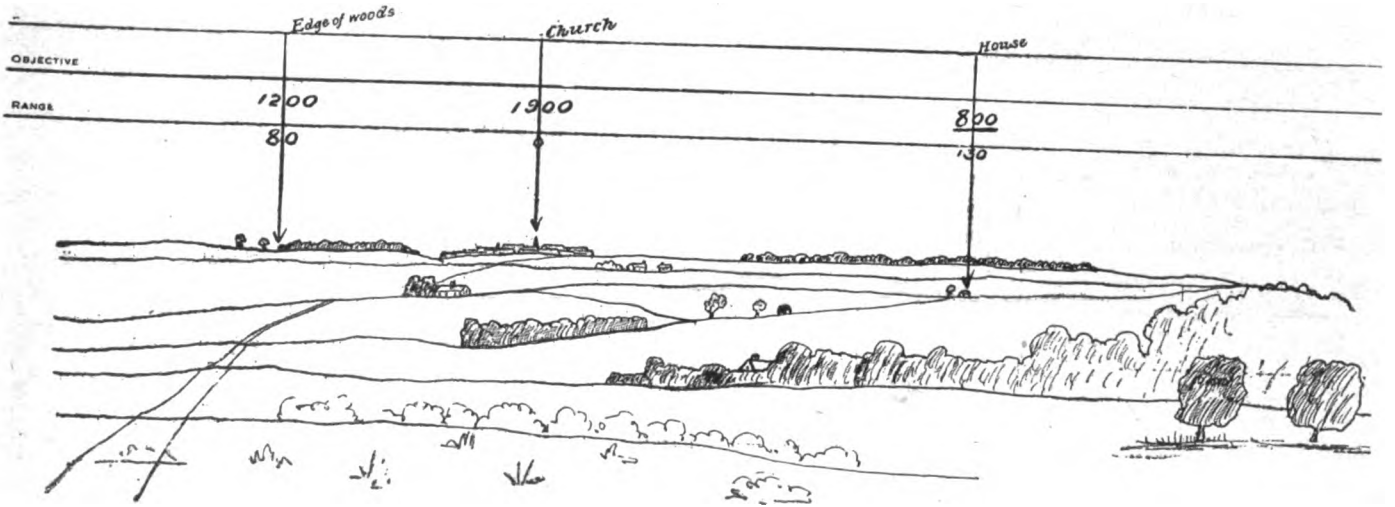

holding sketching pad a convenient distance from the eye and extending verticdl lines from prominent objects to the paper
obtain location of objects by intersecting verticol-lines already drawn by horizontal lines to the objects

Plate 27.

The place where the sketch is made is noted in the lower left-hand corner (Plate 28). The compass bearing is indicated in the center of the lower space marked by X. The date, hour, weather, name, rank, and regiment are indicated at the lower right-hand edge. This data should be printed to avoid errors. The name is sometimes indicated by initials, and the designation of the regiment omitted as a military precaution.

Above the sketch is noted the deflection. A reference point is selected (in this case the church steeple) and marked 0; the other positions are marked as indicated, woods 80 mils left, house 130 mils right. Above the top horizontal line is written the name of the object selected (church). The range is noted in the space marked R. When the range is determined by instrumental means it is underscored, as shown on the right (house *800*); when estimated, it is noted, as church 1900, edge of woods 1200.

To the question, "How much of a sketch should be made and what kind?" The answer is, "A sketch is a correct one *when it conveys properly the intended information.*" Remember, time is a controlling element on many occasions. A scout or artillery observer may have available but a few minutes in which to record the necessary information. If occupying an entrenched position, there might be hours available for making a report and sketch. To meet all emergencies, it is necessary to be able to make hasty sketches.



PLACE MOORE School House

PLATE 28.

DATE 21 May 16. HOUR 11. A.M.

WEATHER Clear.

NAME U.P.H. Scout. Asst.

PLATE 29

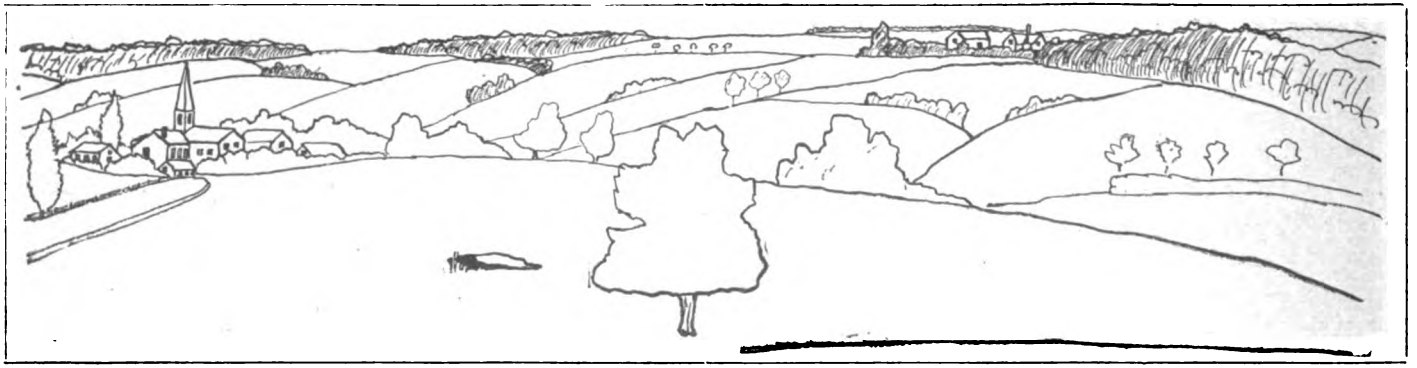


PLATE 30

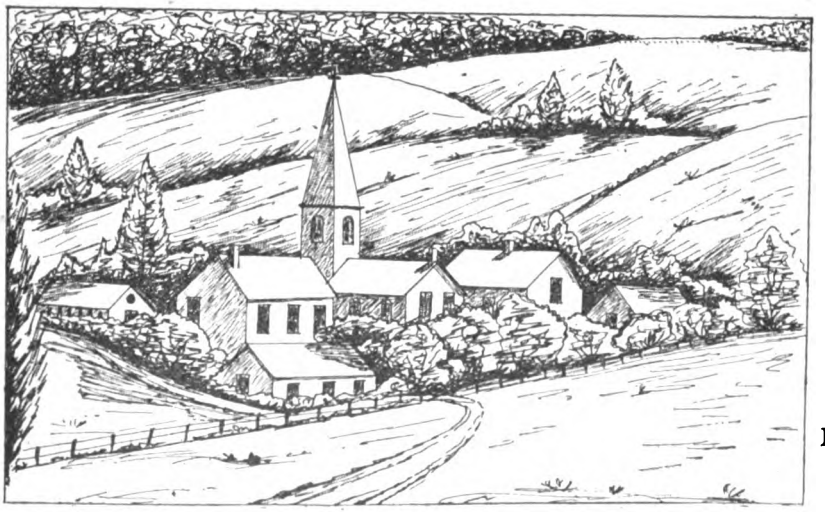


PLATE 31

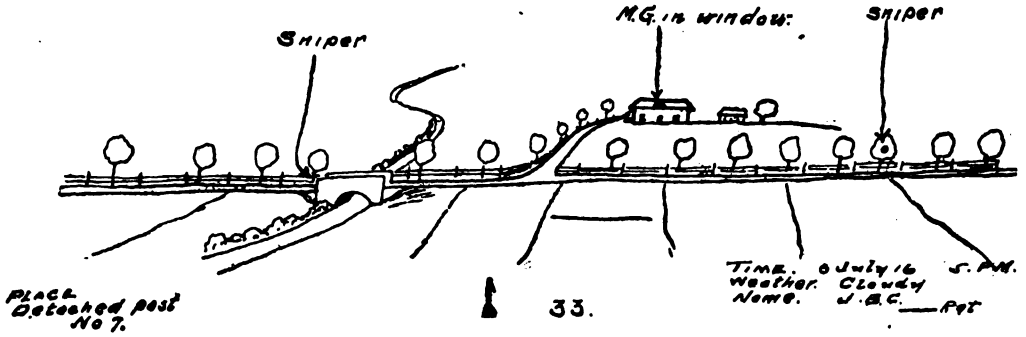
PLATE 32

EXAMPLE OF SKETCHES AND SUB-SKETCHES.

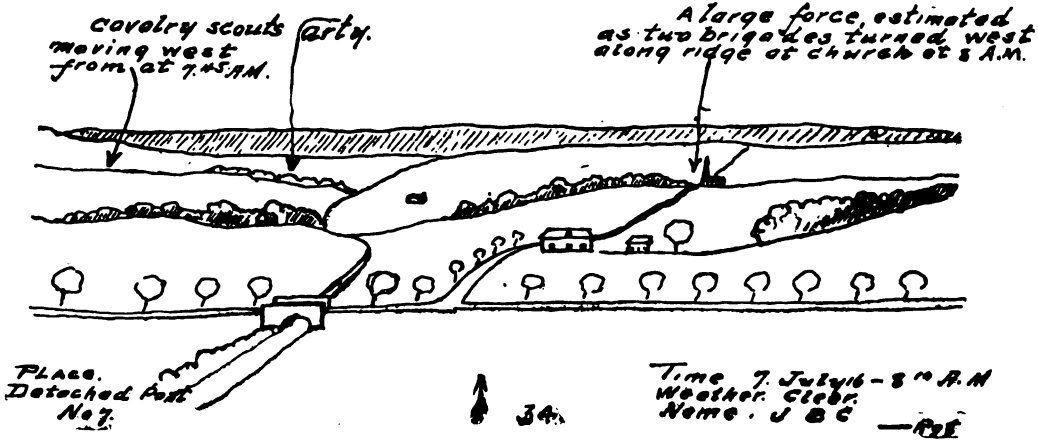
Plates 29 and 31 show sketches which might be of military value, yet the same information is conveyed by sketches 30 and 32 in a more simple manner, requiring much less time and which provides better for the indication of positions.

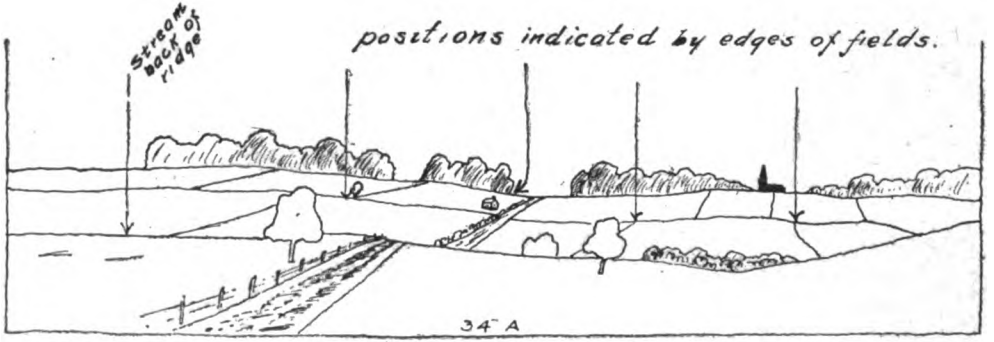
Examples of Hasty Sketching.

An officer on duty with a detached post late in the afternoon observed occasional firing from positions to his front, which he sketched, as shown in Plate 33.



The following morning additional information which he learned required the rendition of another sketch, as shown in Plate 34.


Cavalry scouts moving west from at 7.45 A.M.
Artly.
A large force, estimated as two brigades turned west along ridge at Church at 8 A.M.
Place. Detached Post No 7.
34.
Time. 7 July 16 - 8.30 A.M
Weather. Clear.
Name. J B C Pte


Stream back of ridge
positions indicated by edges of fields.
34 A

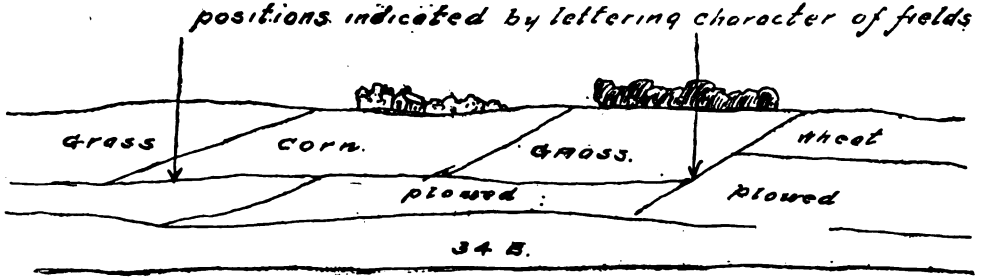

positions indicated by lettering character of fields
Grass
Corn.
Grass.
Wheat
Plowed
Plowed
34 B.

Plate 34 C.

Plate 34 D.

Plate 34 E

Plates 34-C, D, E should be copied, using more of a skeleton outline than the plates show.

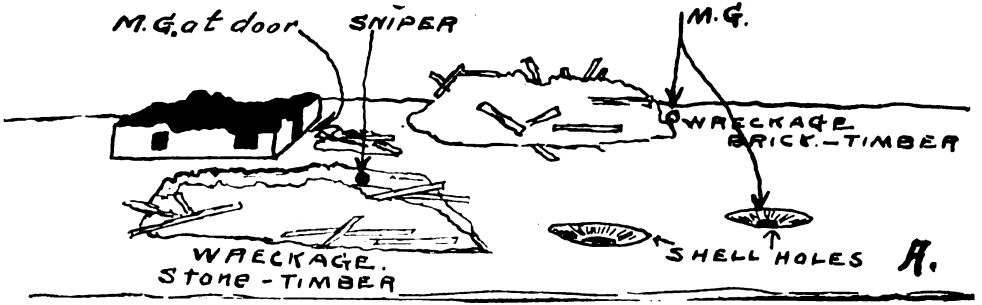
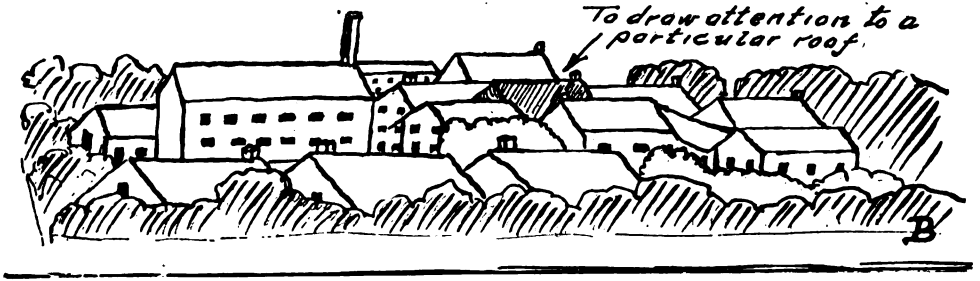
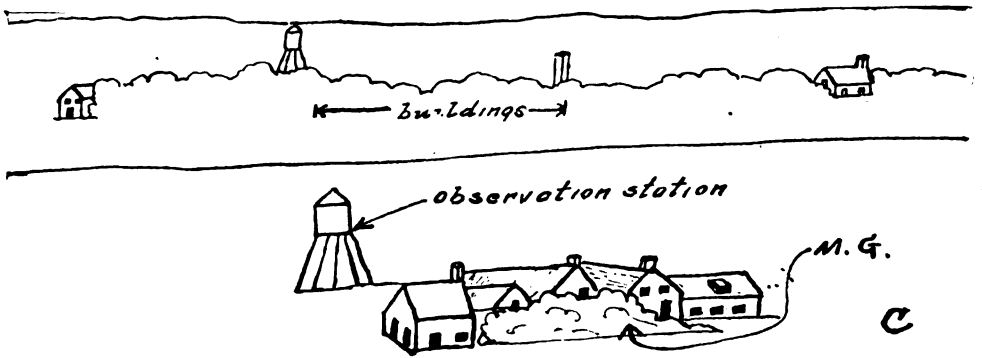
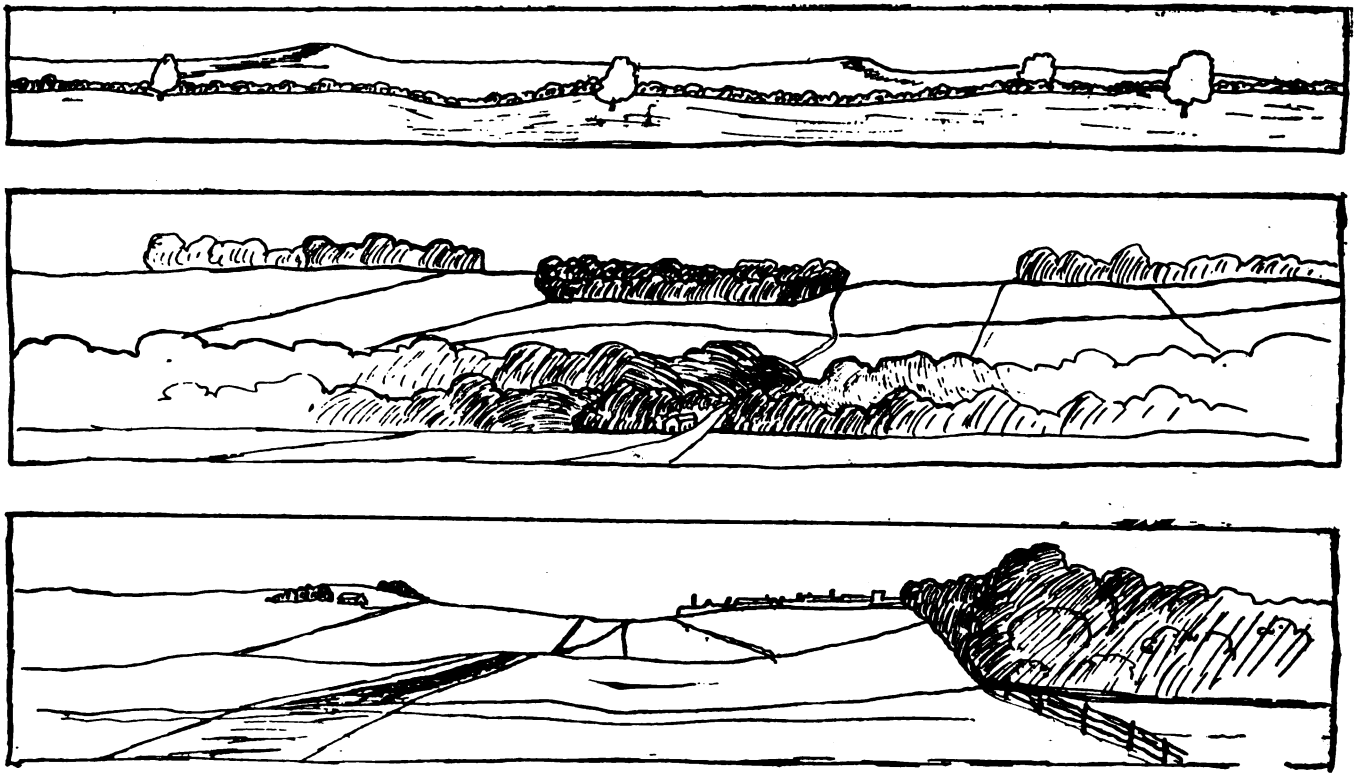


PLATE 35-A.
Shell fire might reduce familiar outlines to a mass of wreckage, but much remains to be portrayed.

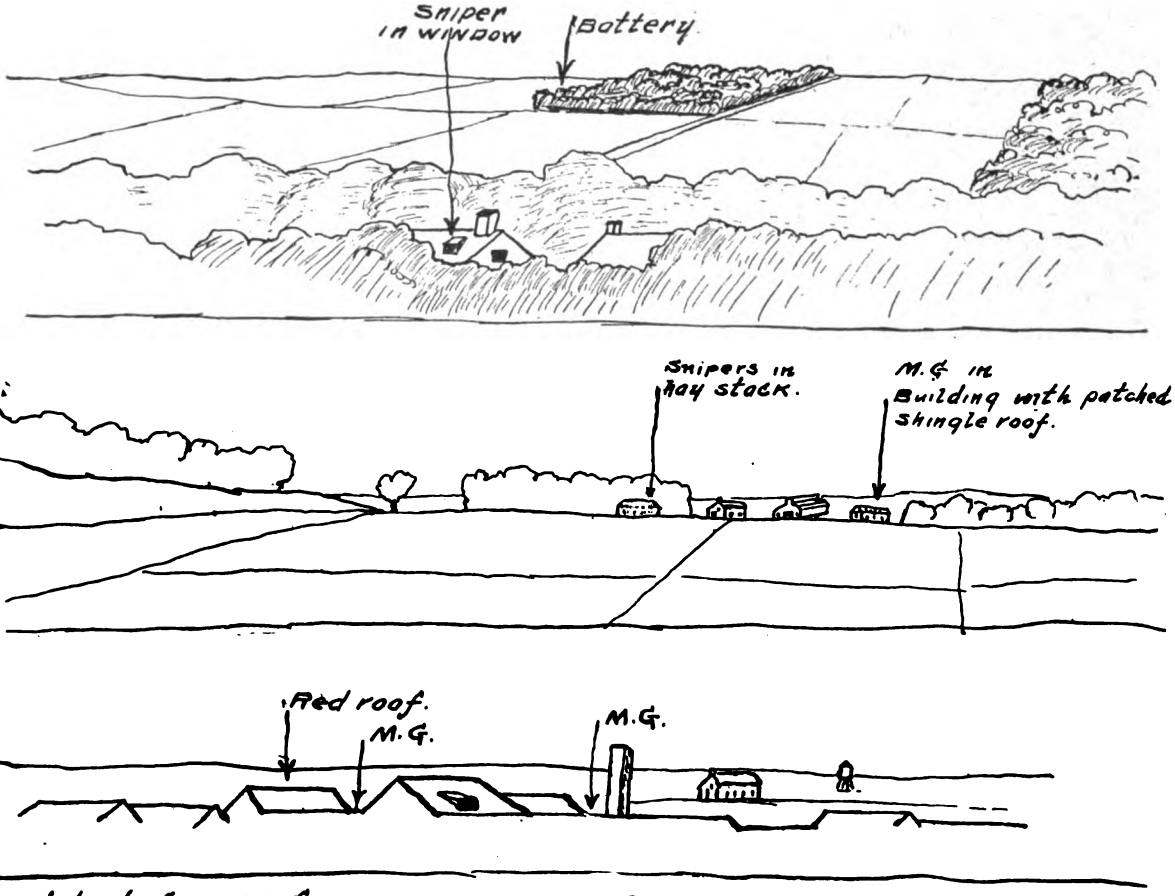




PLATES 35-B, C
show the hasty treatment of particular situations.



Plates 36, show underbrush and foliage outlines.



Sketched from roof of Stones Born

37.

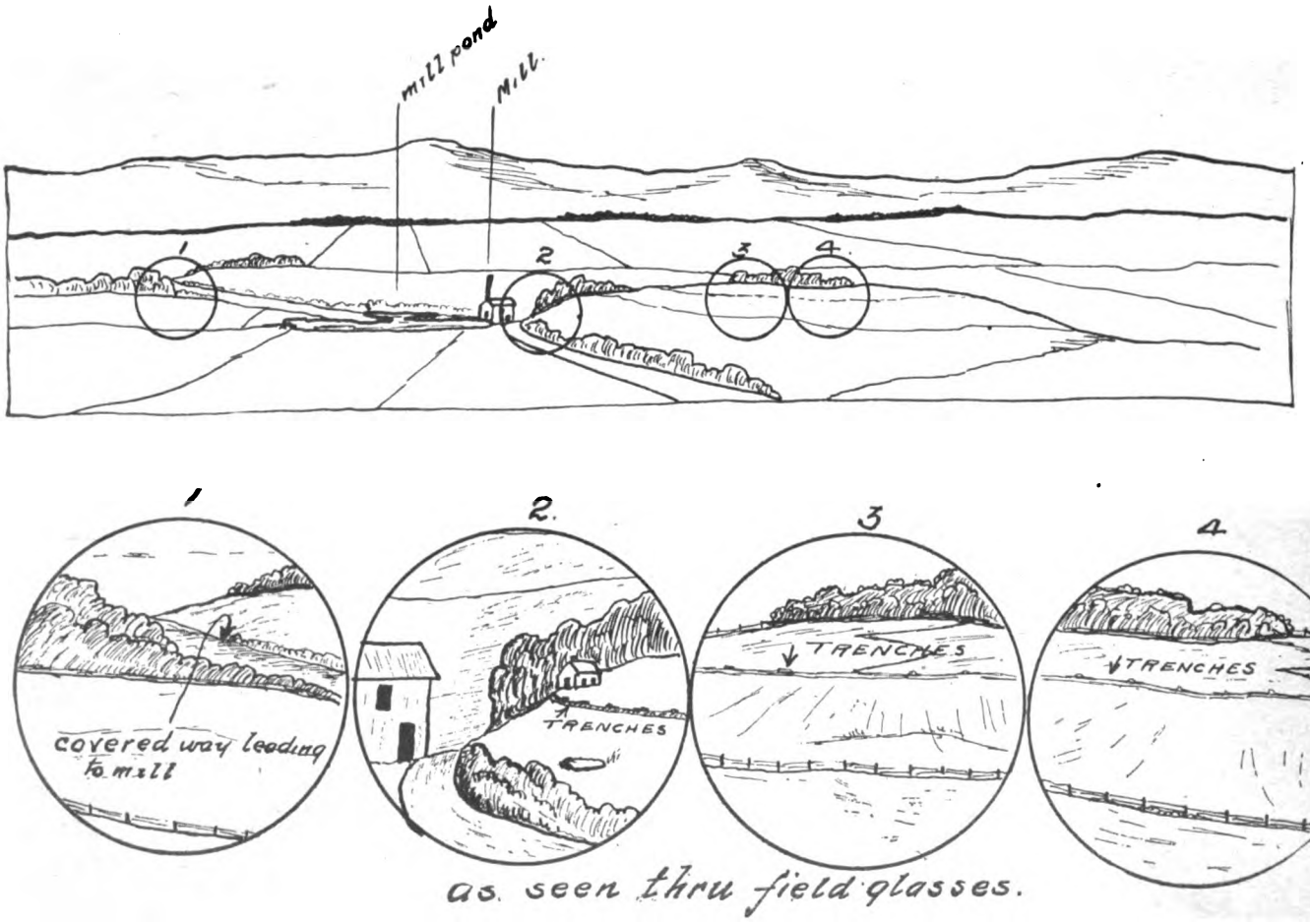
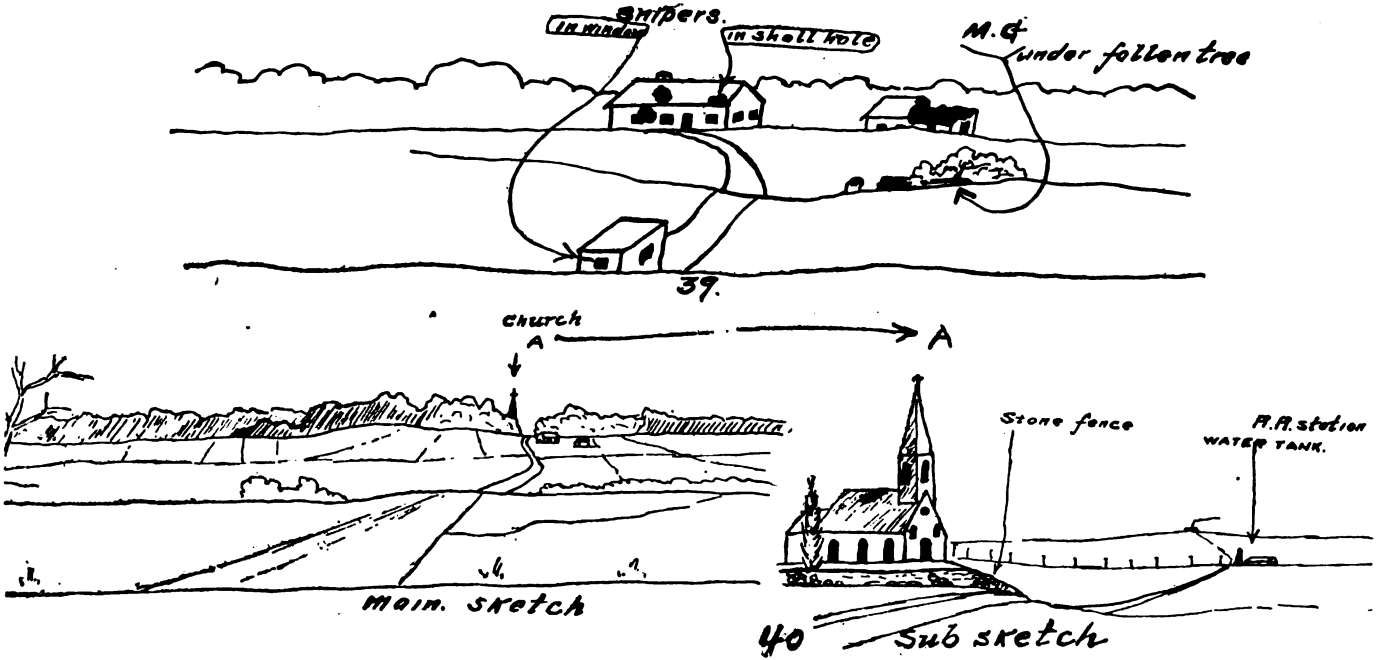
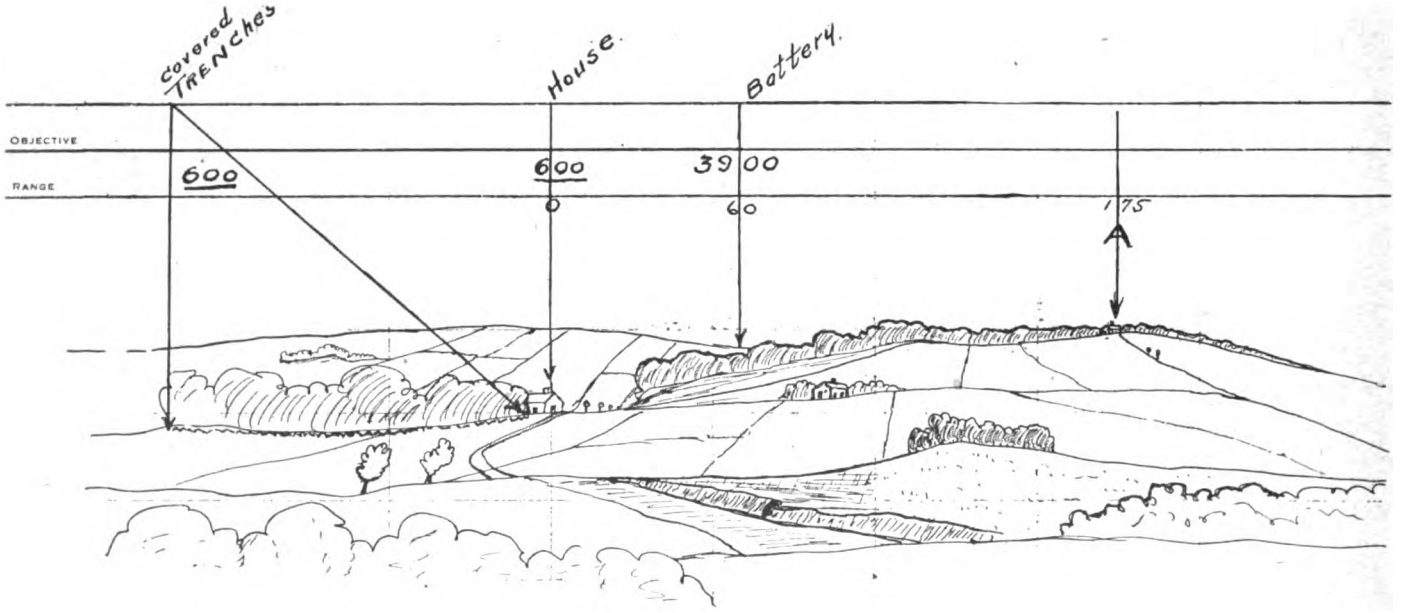

mill pond
Mill.
1
2
3
4
1
2.
3
4
covered way leading to mill
TRENCHES
TRENCHES
TRENCHES
as seen thru field glasses.

PLATE 38.



A sketch and sub sketch by a scout, who had been able to push forward to a position overlooking the church before the advance forces of the enemy drove him back to where his own command established their lines. PLATE 40.

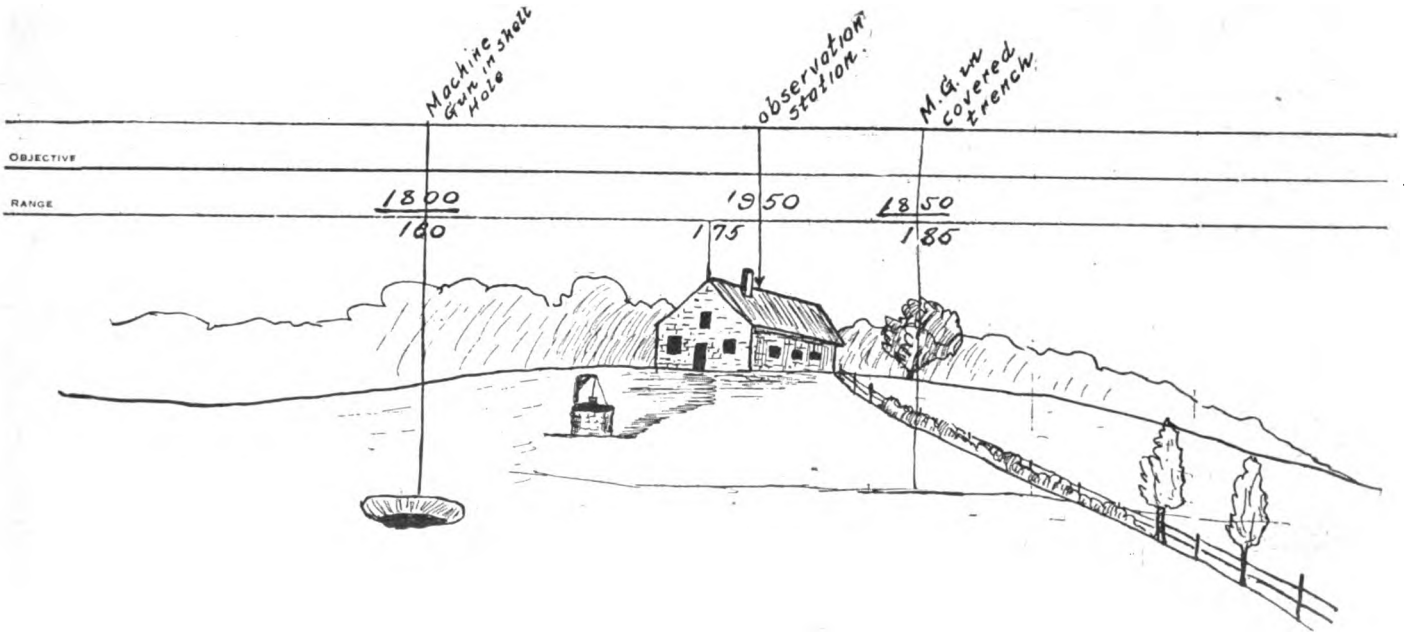


PLACE TRENCH 16 B

DATE HOUR

WEATHER

NAME ....



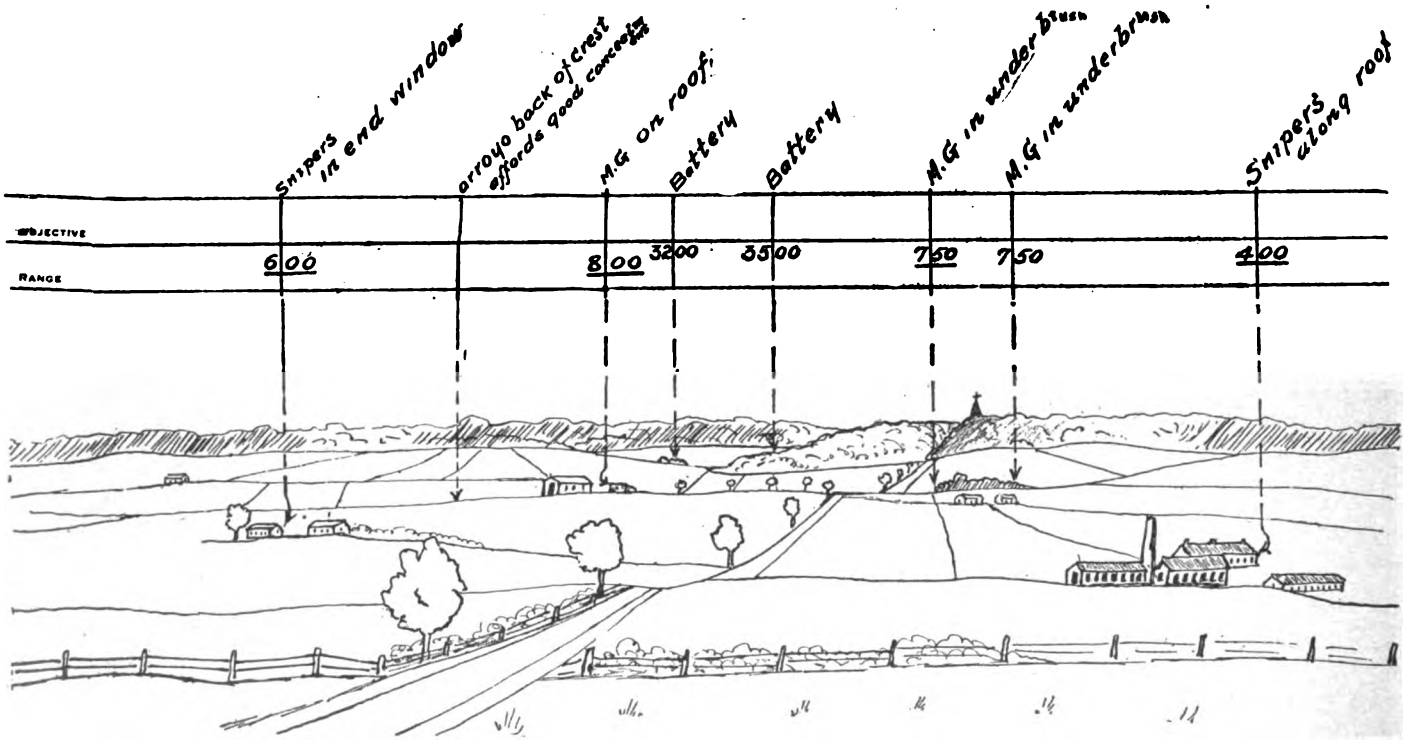
PLACE SUB. SKETCH A.

DATE

HOUR

WEATHER

NAME ....



PLACE Shell - Troy - Cross Roads.

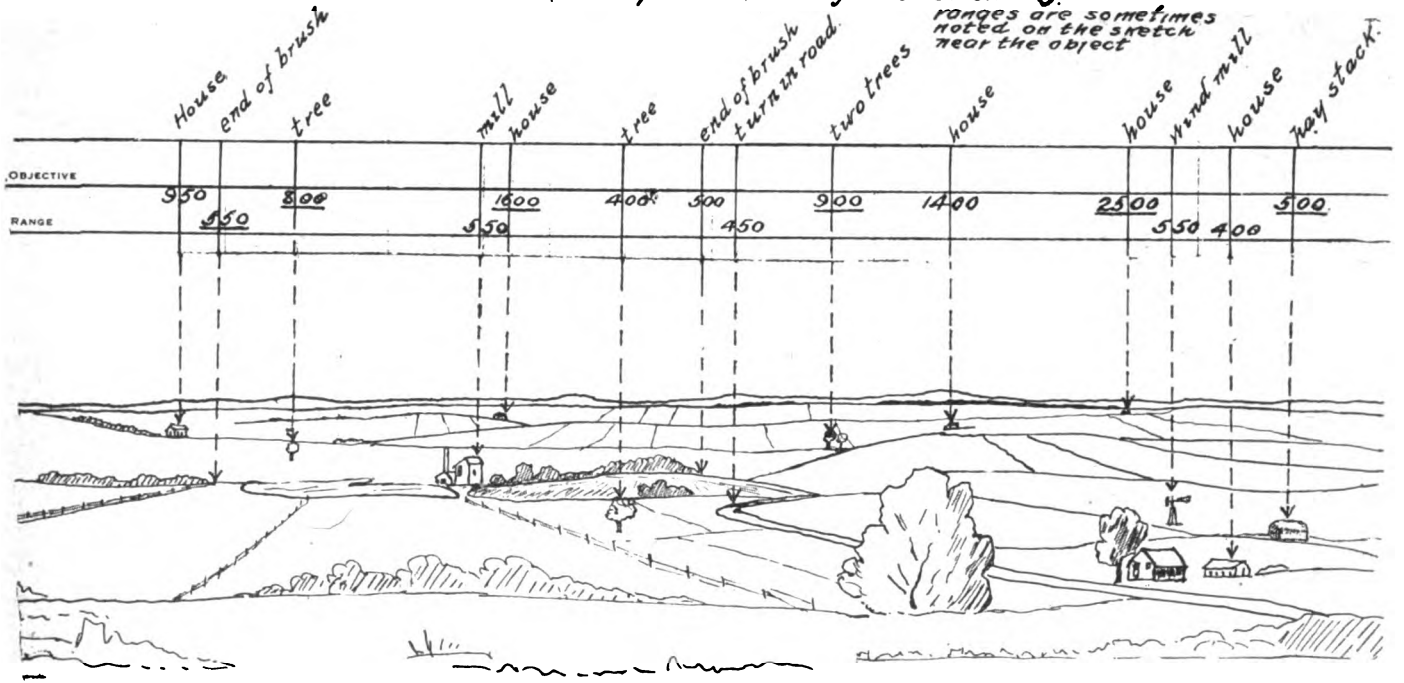
43.

DATE 16 August 16 HOUR 4 P.M

WEATHER Cloudy

NAME H.P.D. ——— Rgt

Range Card for trench #6.



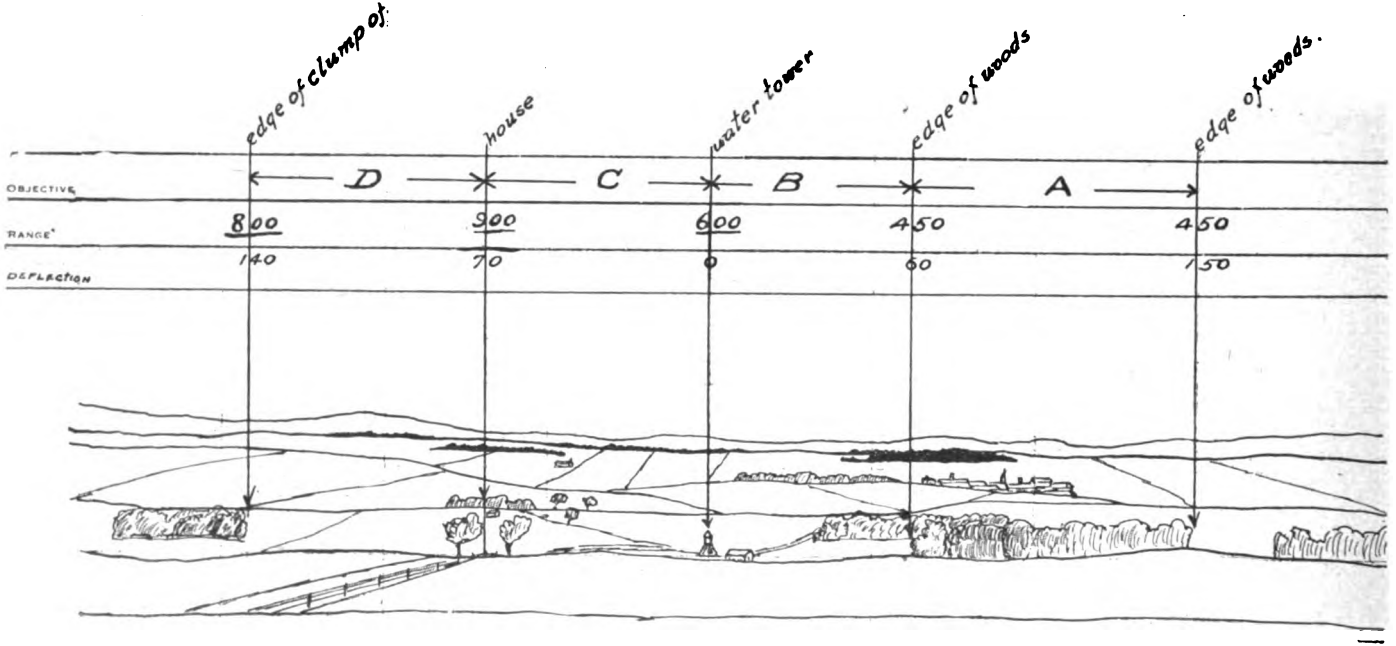
TRENCH #7.

44

DATE 10 July 16 HOUR 11 A.M.

WEATHER Clear.

NAME J.P.H. Rgt.



PLACE Co. "A" TRENCH.

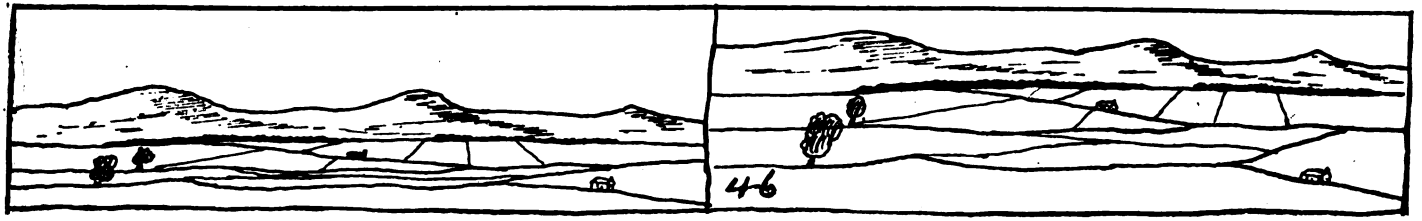
"Assignment of sectors, of objectives.

45

DATE 17. Nov 16 HOUR 11 A.M.

WEATHER Clear.

NAME J. P. S. Age

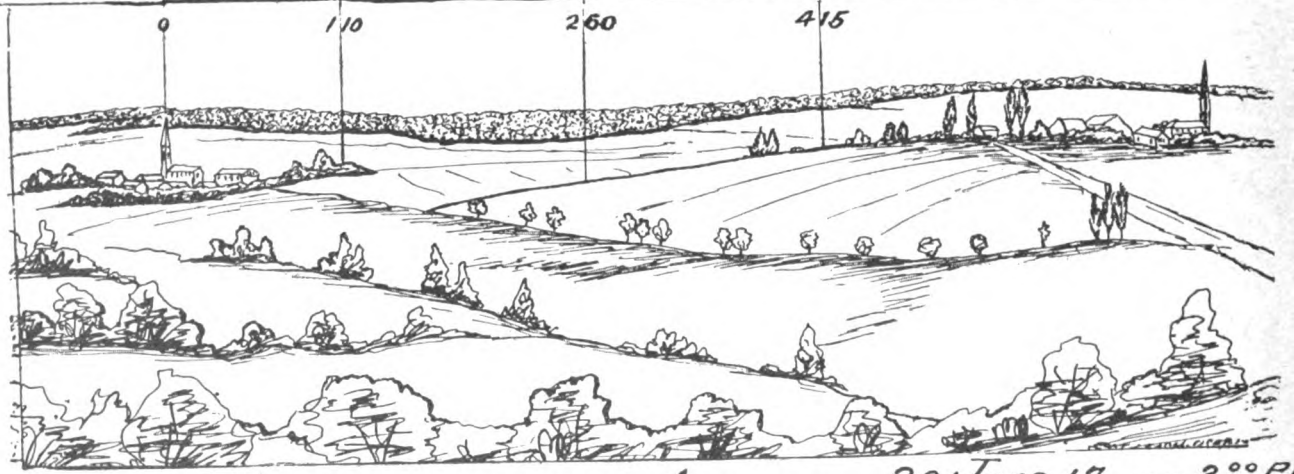


An exact reproduction of a landscape might result in a sketch having a very restricted vertical measurement.

At times, to show details. it is necessary to modify the vertical measurements, representing the ground as if viewed from a greater height (Plate 46).

In sketching it will, no doubt, be noticed that this very thing has been provided for, owing to the natural tendency to enlarge vertical measurement.

	AP.	Battery 3000	Infantry 2000	Battery 2800.
DF		38 20	36 70	35 15
DD		1 05	1 05	1 05
SI		3 00	2 08	3 03
RR		3 2		
RN		3 3 00		
	0	1 10	2 60	4 15



PLACE: MAYTOWN COURTHOUSE TOWER.

47

DATE 20 June 17. HOUR 2 00 PM.

WEATHER Clear.

NAME J. P. Mannus 2nd Lt. — Agt.

By CAPTAIN J. A. CRANE, Field Artillery.

After the completion of the sketch, select some prominent object in the landscape as a reference point. This point should be one that stands out and readily catches the eye and should be the only one of its kind in the sector (avoid one of two objects close by and two similar objects close together). Starting ¼ of an inch above the top horizontal line in the sheet, drop a perpendicular line to the point in the sketch selected as the reference point. At the upper end of the line write "Reference Point" (or "R. P."), sloping upward and to the right at an angle of 45 degrees; the first letter should be directly over the end of the line. On this perpendicular line, just below the six horizontal lines, mark a zero (0).

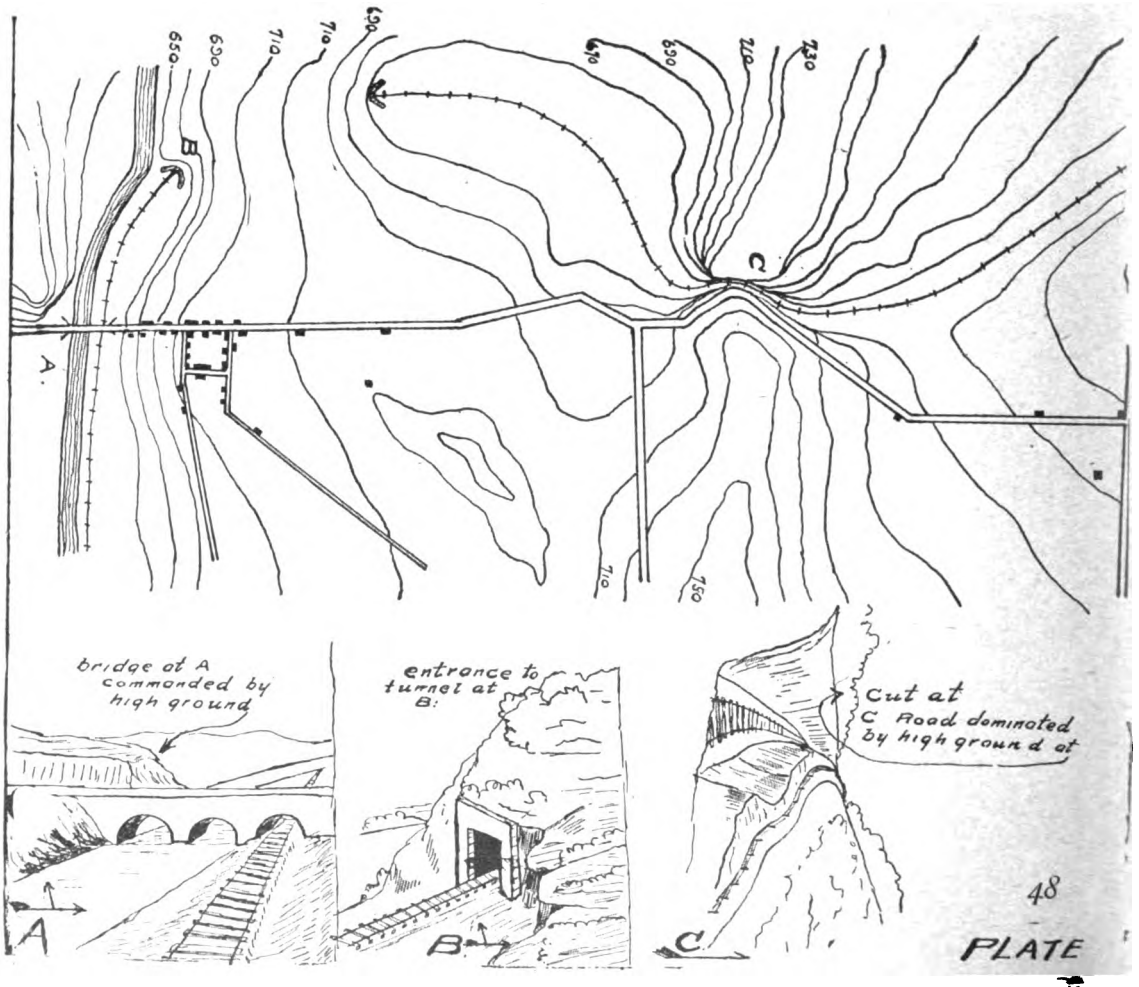
Observing the sector, a battery is located hidden behind a clump of trees. A perpendicular line is dropped to this point in the sketch, as was done for the reference point. In the upper space is written the word "Battery," and immediately under the word "Battery" is placed the estimate of the range. If the range is determined with a range-finder or any other accurate means, the figures are underscored. Measurement is made of the number of mils the battery is from our reference point, which is written on the perpendicular line in the same way as was the zero point—in this case 110.

In the same way an infantry line is located and another battery.

Proceed to get the data for these positions and enter it on the proper perpendicular lines passing through the targets, each item in its proper horizontal space. The spaces from top to bottom are for deflection, deflection difference, angle of sight, corrector, and range. The spaces for corrector and range are *not* filled in until these have been determined by actual fire. After firing on any target, any element of the data found to be different from that originally determined should be corrected on the sketch.

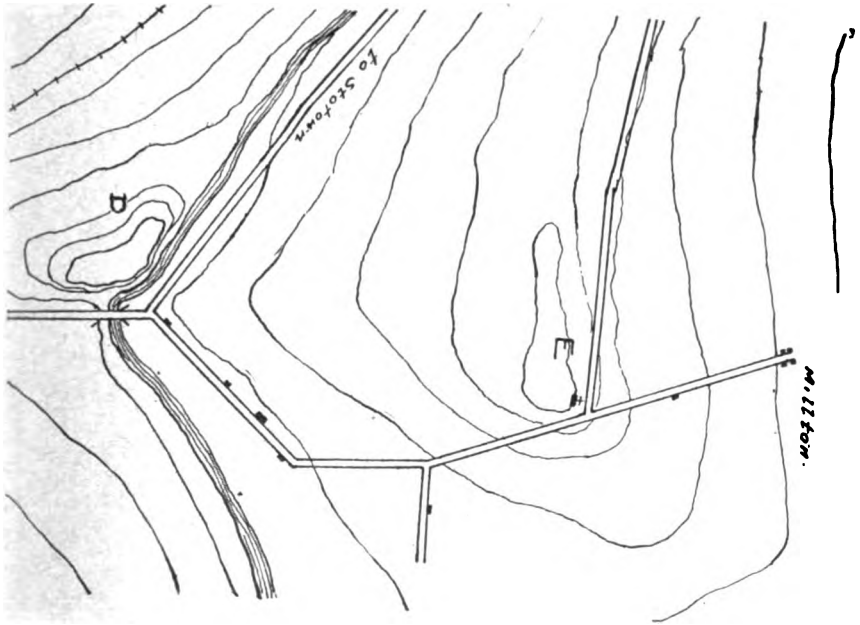
In the sketch as shown, the battery 110 mils to the right of the reference point has been fired on and the complete data entered. For the other two targets, the data have been obtained and entered, except the corrector and range. The sketch shows that the range to the infantry has been measured by some means.

Sub-sketches may be made of any part of this sketch, in which case it is better to refer all measurements of angles to the same reference point as in the large sketch, even though the reference point is not included in the sub-sketch.


650
690
710
690
670
690
710
730
710
730
A
B
C
bridge of A commanded by high ground
entrance to tunnel at B
Cut at C flood dominated by high ground at
A
B
C

48

PLATE



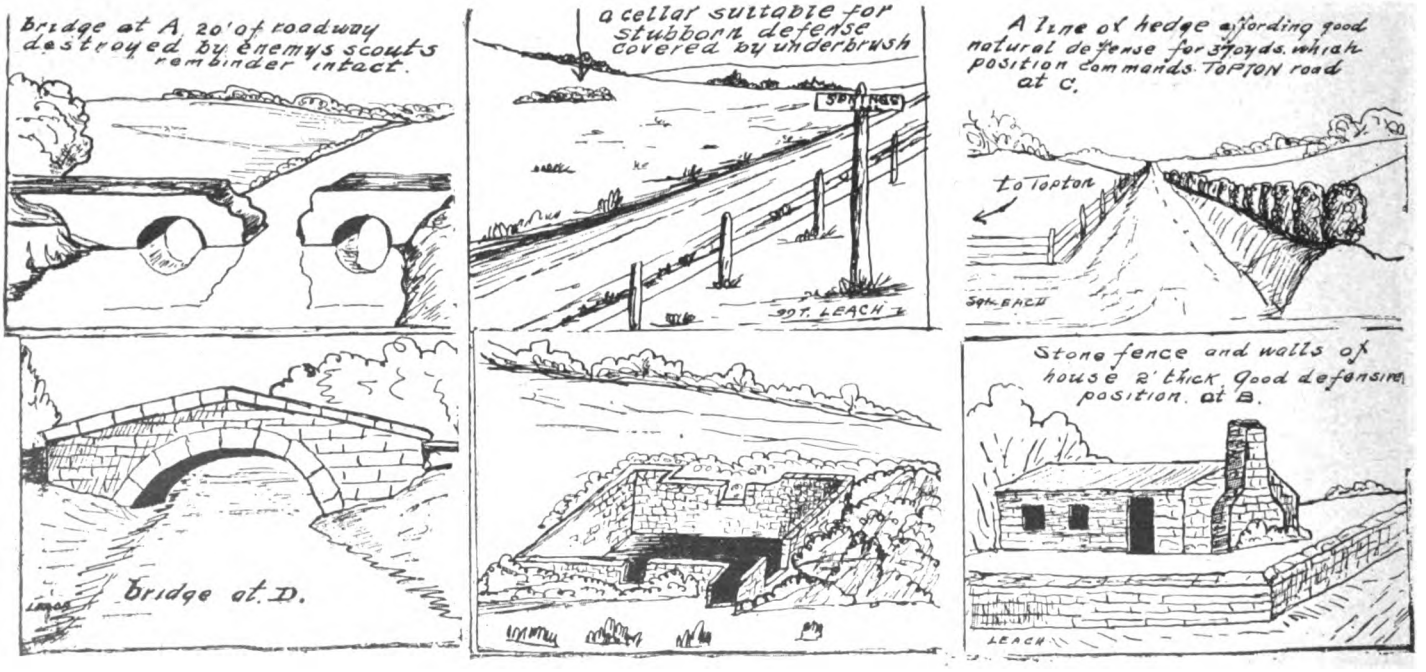
MARGINAL SKETCHES.

Amplification of a Map.

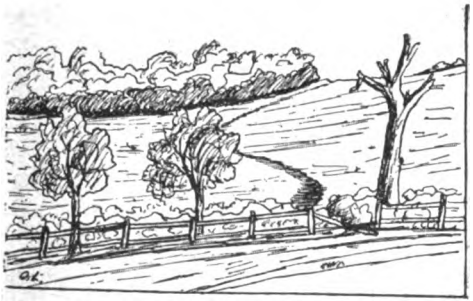
A map can be made more comprehensive by the addition of small marginal sketches, as shown in Plates 48, 49, and 50. The direction in which the observer views the object when the sketch is made is usually noted aside of the key letter of the sketch.

With the map alone, delay might be experienced in locating a road, crossing, trail, bridge, or position, and difficulty encountered in determining the value of certain features of the terrain for defensive purposes, which can all be cleared away by the addition of explanatory marginal sketches.

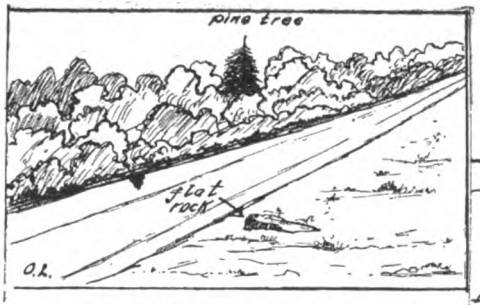
A commander is assisted materially in rendering a decision and a subaltern aided in carrying out his mission by having a map illustrated with panoramic sketches.


Bridge at A. 20' of roadway destroyed by enemys scouts rembinder intact.
a cellar suitable for stubborn defense covered by underbrush
A line of hedge affording good natural defense for 350yds. which position commands TOPTON road at C.
To Topton
Bridge at D.
Stone fence and walls of house 2' thick. Good defensive position. at B.

PLATES 49.



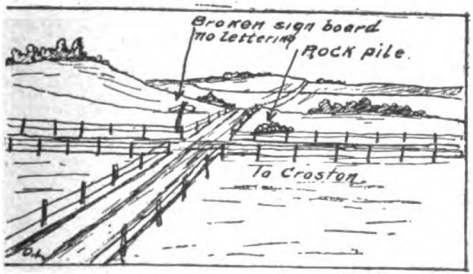
The trail to FRAZERS SPRING indicated by old dead tree
Trail not visible from road by reason of underbrush.



A trail otherwise difficult of location is found from following note.

100 yds west of flat rock is trail to camp No 7. PINE tree appears above foliage line at this point 1½ miles west of HUTTEN FORD

An advance moving west would be visible at this point from church at MARTIN
Cover from view from church obtained by conducting march as indicated by dotted line. These woods provide cover to within one mile of Church.



The crossroad to CROSTON is indicated by the general appearance of the terrain and the location of the stone pile.

Appearance of terrain three miles west of MORTON

PLATE 50.

SKETCHING EXERCISES.

The following outline of exercises, covering a period of six hours, has been found to give good results. With this schedule, however, the idea of *intensive* training was paramount, and it is but natural that a man who was able to grasp the details of panoramic sketching in this short period was also able to greatly improve himself by a repetition of this same work.

First. The hand must be trained to represent and delineate objects.

Second. The eye must be trained to interpret perspective and the essential parts of a portion of terrain.

(*Making copies of landscape drawings is the best method for beginners.*)

All exercises free hand.

EXERCISE 1.

Time 5 minutes: (*a*) With one stroke of the pencil, draw a series of straight vertical and horizontal lines, varying in length from ⅛ inch to 1½ inches. (Plate 8.)

Time 5 minutes: (*b*) In a similar manner, draw foliage line. (Plate 9.)

Time 5 minutes: (*c*) Draw Plate 9.

Time 15 minutes: (*d*) Make a sketch of Plate 1, following the successive steps shown in Plates 2, 3, 4, 5, 6, and 7.

In Exercise *c* inability will be noticed in drawing vertical lines, which will make the buildings appear somewhat unusual. Exercise A is intended to correct this fault.

me 30 minutes: (*e*) Make a sketch of photograph, Plate 10.

EXERCISE 2.

Time 20 minutes: (*f*) Repeat such parts of Exercise 1 as are thought necessary.

Time 40 minutes: (*g*) Sketch photographs 11, 12, 13, and 14

EXERCISE 3.

Time 10 minutes: (*h*) Same as (*f*), Exercise 2.

Time 30 minutes: (*i*) Sketch Plates 16 and 17, making 17 first.

Time 20 minutes: (*j*) Sketch Plates 18, 19, 20, 21, and 22.

EXERCISE 4.

Time 1 hour: (*k*) Make a sketch of Plates 29, 34c, 34d, and 34e, using the methods shown in Plate 26, holding the pencil about 10 inches from the eye and 3 inches from the plate.

(*l*) Try same sketch using method shown in Plate 27.

EXERCISE 5.

Time 1 hour: (*m*) Make a sketch of a section of terrain close at hand, using methods of Exercise 4.

EXERCISE 6.

Time 20 minutes: (*n*) Using same terrain as in Exercise 5, make a hasty sketch, assuming certain positions occupied by the enemy, and complete sketch as shown in Plate 43.

Time 20 minutes: (*o*) Try same sketch as (*n*) and try to improve it, taking less time.

Time 20 minutes: (*p*) make a sub-sketch in addition to sketch Made in Exercise (*o*).

Total time, 6 hours.